	Roll No		[Total No. of Pages :
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õ	B.Tech. V Semester (M	ain &Back) Exami	nation, Nov./ Dec 2017
U)		Civil Engineering	Soundary All Manis
G		LIVII Engineering	

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

a) Define kinematic, indeterminacy. Calculate kinematic indeterminacy for the following structures. (6)



b) Write and prove Maxwell Betti's generalized reciprocal theorem. (4)

c) In a cantilever Beam AB, of span *l*, fixed at A and carrying a point load P at the free end B, the deflection 'y' of a section X, distance x from A is given by

 $y = \frac{px^2(3l-x)}{6EI}$. If the cantilever is now loaded with a concentrated load W at X and propped at B to the same level as A, show by the reciprocal theorem, that the reaction $R_B = \frac{Wx^2(3l-x)}{2l^3}$ E is modulus of elasticity and I is moment

of inertia of the beam.

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[Contd....

(6)

Analyze the rigid frame shown in fig. 2 using slope-deflection method. Draw the BMD.
 Charles and Cha



- -8. -

- Unit II
- A portal frame ABCD as shown in fig. 3 is hinged at A and fixed at end D. Analyze the frame using moment distribution method and draw the BMD and deflected shape.



2. A horizontal beam ABCD is supported on hinges at all the supports. The beam is loaded as shown in Fig. 4. Take moment of inertia as 2.4×10^6 mm⁴ and $E = 2 \times 10^5$ N/mm². Solve the beam using moment distribution method if the support B sinks by 30mm and C sinks by 20mm down respectively from the original some level. Draw BMD and deflected slope of beam. (16)



Unit-III

3. Determine the horizontal deflection of roller support C of the frame shown in fig. 5 due to applied load of 80kN being applied at B. Area of members AB, BC and BD are each of 800mm² and AD and CD are each of 1600mm² area. Take $E = 2.06 \times 10^5 \text{ N/mm}^2$.



3. Find the forces in all the members of the frame shown in fig. 6. All the bars of some area of cross section and of some material. Use strain energy principles for solution.



Unit-IV

- 4. a) Derive the generalized column flexure formula to obtain stress 'f' at any point (x,y) in a column section subjected to axial load and moments. Write the sign conventions to be adopted while applying the formula.
 (8)
 - b) A fixed beam AB, carries a point load W at a distance L/4 from support A. Calculate support moments using column analogy method. Take EI constant. Draw BMD.
 (8)

OR

4. Solve portal frame ABCD using column analogy method. Draw BMD fig. 7. (16)



[Contd....

(16)

(16)

5. In fig. 8, plan of a tripod is shown. The feet A, B and C being in some horizontal plane and apex D being 3.25m above the plane. Horizontal force of 100 kN and 50 kN are applied at D in the direction shown in fig. 8. Find the forces in member assuming that all joints are pin joints. (16)



OR

A building frame consists of three equal bays of 4m width and height of each storey is 4m. Find out wind moments, shears and direct forces in all columns and girders using portal method. Also mention the assumptions used in portal method fig.9. (16)





Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. <u>IS-456-2000</u>

Unit - I

- 1. a) Explain the terms : Characteristic load design load and partial safety factor for loads.
 - b) Design a singly reinforced concrete beam which has width 300 mm, total depth 700 mm, with a cover of 40 mm to the centre of the reinforcement. Design the beam if it is subjected to a total bending moment of 120 KN-m. Use M 20 concrete and HYSD bars of grade 415. (10)

OR

a) Using working stress method, design a reinforced concrete beam subjected to a bending moment of 20 KN-m. Use M 20 concrete, and Fe-415. Keep the width of the beam equal to half the effective depth.

 $(\sigma_{c1c} = 7N/mm^2 m = 13.33 \sigma_{st} = 230 N/mm^2)$

b) Design a doubly reinforced concrete beam 300mm wide and 400 mm deep of grade M 20, to resist an ultimate moment of 150 KN-m, using mild steel bars of grade Fe250.
 (10)

Unit - II

Design a R.C Slab for a room having dimensions 3m×7m. The thickness of supporting wall is 300 mm. The slab carries 100 mm thick lime concrete at its top, the unit weight of which may be taken as 20 KN/m³. The live load an the slab may be taken as 2 KN/m². Assume the slab to be simply supported at ends. Use M20 concrete and Fe 415 steel. (16)

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1.

[Contd....

- 2. Describe different types of shear reinforcement. a)
 - (6) A simply supported R.C.C. beam 250 mm wide and 450 mm deep (effective) b) is reinforced with a 4-18 mm diameter bars. Design the shear reinforcement if M 20 grade of concrete and Fe 415 steel is used and beam subjected to a shear force of 150 KN at service state. (10)

Unit - III

Design a R.C slab for a room measuring 4 m \times 6m size. The slab is simply. 3. Supported on all the four edges, with corners held down, and carries a superimposed load of 3000 N/m², inclusive of floor finishes etc. Use M 20 mix, Fe 415 steel and

OR

3. Design the interior panel of a flat slab 5.6 m \times 6.6 m in size, for a super imposed load of 7.75 KN/m². Provide two-way reinforcement. Use M 20 concrete and Fe (16)

Unit - IV

- 4. Design a short axially loaded square column, 500×500 mm for a service load a) 2200 KN. Use M 20 concrete and Fe 415 grade steel.
 - (8)Design a circular column to carry an axial load of 1000 KN. Use M 20 concrete b) and Fe 415 steel. (8)

OR

- 4. What is the function of longitudinal and transverse reinforcements in column.(4) a)
 - Design the longitudinal reinforcements in a rectangular reinforced concrete b) column of size 300 mm \times 600 mm subjected to factored load of 1500 KN and a factored moment of 250 KN-m with respect to the major axis. Adopt M 25 grade concrete and Fe 415 HYSD bars. (12)

Unit - V

- 5. Describe various types of footings. a)
 - (6)Design a square footing of uniform thickness for an axially loaded column of b) 450×450 mm size. The safe bearing capacity of soil is 190 KN/m². Load on column is 800 KN. Use M 20 concrete and Fe 415 steel

OR

Design a rectangular footing of uniform thickness for an axially loaded column of 5. size 300 mm \times 600 mm load on column is 1200 KN. Safe bearing capacity of the soil is 200 KN/m². Use M 20 concrete and Fe 415 steel

(16)

(10)

(16)

(2)

	Roll No [Total No. of Pages : 2
62	5E5062
0	B.Tech. V Semester (Main/Back) Examination, Nov./ Dec 2017
	Civil Engineering
	5CE2A Environmental EnggI

18/11

Time: 3 Hours

1

Maximum Marks: 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

) Denema	a)	What do you mean by environment? What are the components of environment?Describe role of an environmental engineer.(8)
	b)	Describe various types of water demands. (8)
		OR
1.	a)	What is per capita demand? How can we measure/find out it and what are the important factors which affect it? (8)
	b)	Explain the terms – population forecasting and design period. Also discuss the factors which affect water consumption. (8)
		Unit - II
2.	a)	How is the surface water different than ground water in terms of quality? Explain with suitable examples and also describe other sources of water. (8)
	b)	What do you mean by hydrological cycle? Draw a neat sketch and explain the processes involved in it. (8)
		OR
2.	a)	How do we assess the yield of a ground water source? Also explain the

- process of development of a source. (8)
 - List out the chemical, physical and biological standards of drinking water b) with their permissible limits as per the Indian standards. (8)

Unit - III

- a) What are the different types of pipes used in water supply? Explain their merits and demerits along with the selection criteria and factors affecting their selection.
 (8)
 - b) What are the different unit processes involved in water treatment. Explain solids separation in detail. (8)

OR

- 3. a) What are the different types of pumps used in water supply? Describe their suitability with comparison. (8)
 - b) What do you understand by softening of water? Explain in detail, any one method with neat sketch. (8)

Unit - IV

- 4. a) Explain the process of filtration and working of rapid sand filters with suitable sketch. (8)
 - b) Explain the removal of dissolved solids from water with suitable explanation of the methods. (8)

OR

- 4. a) What is disinfection of water? Describe the process and different methods used for this purpose with their suitability. (8)
 - b) Compare slow sand filters with rapid sand filters.

Unit - V

- 5. a) What are the methods of water distribution? Explain the components of distribution system. Also discuss types of distribution reservoirs. (8)
 - b) Explain the Hardy Cross method for analysis of pipe networks with suitable example.
 (8)

OR

- 5. Write short notes on any Four :
 - i) Components of water service connection
 - ii) Plumbing systems
 - iii) Layout of Distribution system
 - iv) Mass curve method
 - v) Fire Hydrants

(2)

 $(4 \times 4 = 16)$

(8)

R	oll No	[Total No. of Pages : 4
2	5E3153	RHRI nation mudo)
	B.Tech. V Semester (Back) Examinat	tion, Nov./Dec 2017
2	Civil Engineering	
T	5CF3 (O) Steel Structure	es - I

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

21/11

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

- 1. IS 800: 2007
- 2. IS.I- Hand book for structured Engineers Part I (Steel Tables)

Unit - I

- a) Two plates each of 10mm thickness are butt jointed with double cover each 6mm thick, if the joint is single bolted and bolts are of 20mm diameter provided at 60mm pitch, calculate the efficiency of the joint. The bolts are of grade 4.6 and steel of Fe 410. (12)
 - b) What are the advantages of welded joints over bolted joints. (4)

OR

- a) A Tie member consisting of An ISA 80mm × 50mm × 8mm (Fe 410 grade steel) is welded to a 12mm thick gusset plate at site. Design welds to transmit load equal to the design strength of the member. (6)
 - b) Two framing angles ISA 150 mm \times 150 mm \times 10 mm are used to make beam to column connection. One angle is placed on either side of the web of the beam as shown in figure. Three bolts of 16 mm diameter and of 4.6 grade are used to connect the angle legs to the beam web. Determine the reaction that can be transferred through the joint

[Contd....

Given:

Column section ISHB 300 @ 618.03 N/m $t_f = 10.6$ mm

(10)

(16)

Beam section ISMB 350 @ 514.04 N/m $t_w = 8.10$ mm



Unit - II

A column in a building is 4m in height It's bottom end is fixed and top end is hinged. The reaction load due to the beam is 500 KN at an eccentricity of 60 mm from the major axis of the section. Check whether ISHB 300 @ 0.58 KN/m section is adequate.

OR

- a) An ISA 125 mm × 75 mm × 8 mm is used in a steel roof truss as discontinuous strut. Find its compressive strength if it is 2.1m long between centres of bolted connections.
 - b) Design a stanchion 3.5 m long, in a building, subjected to a factored load of 550 KN. Both the ends of the stanchion are effectively restrained indirection and position. Use steel of grade Fe 410. (10)

Unit - III

3. Design a laterally supported beam of effective span 6m for the following data.

Grade of steel : Fe 410

Maximum bending moment : M = 150 KNm

Maximum shear force : V = 210 KN

Check for deflection is not required.

OR

Design a two tier grillage foundation for a column ISHB 350 @ 67.44 kg/m carrying a factored axial load of 1700 KN. The steel base plate under it measures 600 mm × 600 mm. Take safe bearing capacity of the soil as 170 KN/m². (16)

5E3153

Unit - IV

4. a) What is shear lag? What are the types of failures in tension member.

b) A column section ISHB 450 @ 907.4 N/m is subjected to following factored loads. Axial compressive load p = 500 KN, Moment M = 100 KNm Assuming M 30 grade of concrete for the pedestal and a square base plate, Design thickness of base plate, anchor bolts and design connection with welding.(10)

OR

- 4. a) Draw the view of a Bolted gusset base for a column and label the components.
 - b) A tension member ISLB 250 @ 273.7 N/m is connected with two plates 175 mm wide and 10 mm thick with two lines of 16 mm diameter bolts in each flange. The end connections are as shown in figure. Determine. (10)
 - i) The design tensile strength of ISCB section used
 - ii) The design tensile force which the plates can transfer. Use Fe410 grade of steel.



- Unit V
- 5. a) Find shape factor of a triangular section.
 - b) Compute the collapse load for a portal frame the whole frame is of uniform Mp
 W (12)



[Contd....

- 5. a) State 'Statical Theorem' and 'Kinematical Theorem' for Computing Collapse load in a Structured by plastic Theory. (6)
 - b) Find out the collapse load for a continuous beam of uniform cross section.(10)





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Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

- 1. a) Explain the Hydrometer test in detail with stretches.
 - b) A soil has a porosity of 40%, The specific gravity of solids 2.65 and a water content of 12%. Determine the weight of water required to be added to 100 m³ of this soil for full/saturation.
 (8)

OR

1. a)

Write about the is classification system of soil in detail.

b) Explain the liquid limit, plastic limit and shrinkage limit with fig and methods to find shrinkage limit.
 (8)

Unit - II

- a) What are the different types of soil structures which can occur in nature.
 Describe in detail. (8)
 - b) Discuss the characteristics and construction of montmorillonite' and Illite mineral groups. (8)

OR

- a) What are different methods for determination of the co-efficient of permeability in laboratory. Discuss their limitations. (8)
 - b) Explain permeability of stratified soil mosses. (8)

[Contd....

(8)

(8)

Unit - III

- a) What is quick sand? How would you calculate hydraulic gradient required to create quick sand conditions in a sample of sand? (8)
 - b) Define total stress, neutral stress and effective stress. What is importance of effective stress.
 (8)

OR

- 3. a) Explain the term piping and uplift pressure.
 - b) Explain the method of constructing a flow net in an earth dam consisting of two different zones.
 (8)

(8)

(8)

Unit - IV

- 4. a) Describe direct shear test. What are its merits and demerits.
 - b) Explain unconfined compression test with fig. What is advantage over triaxial test.
 (8)

OR

- 4. a) A cylindrical specimen of saturated clay, 4 cm in diameter and 9 cm in overall length is tested in unconfined compression tester. The length of specimen after failures is 8 cm. Find the unconfined compressive strength of clay, if the specimen foils under and axial load of 46.5 N.
 - b) What is Mohr's strength theory for soils stretch typical strength Envelop for a clean sand.
 (8)

Unit - V

- 5. a) Describe standard proctor test and Modified proctor tests. (8)
 - b) What are the factors that effect compaction? Discuss in brief. (8)

OR

- a) What are the different methods of compaction in field. How would you select the type of roller.
 (8)
 - b) What is mechanical stabilization. What are factors that affect the mechanical stability of mixed soil. (8)

10	Koll No.	[Total No. of Pages : 3
155		5E3155
E3	B. Iech. V Seme	ster (Back) Examination, Nov./Dec 2017 Civil Engineering
5	5CE5(0)	Quantity Surveying & Valuation

211

Time : 3 Hours

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	Discuss the importance of quantity	Survey and up	broting (1 :	
		construction projects	survey and va	luation techniques in c	ivil
		F5)+++0,			(8)

b) Enumerate different types of estimate and explain each.

OR

- 1. Differentiate the following :
 - a) Book value and Assessed value
 - b) Distress value and salvage value
 - c) Free hold and Lease hold properties.

Unit - II

- a) Write down the specifications for 1st class brick work in cement mortar 1 : 6 in super structure. (10)
 - b) Explain the term "Deposit work".

OR

 a) Prepare detail rate analysis for providing and laying cement concrete work M 20 grade excluding the cost of reinforcement for reinforced concrete work.

b) Explain the term tender and its important features.

(6)

(10)

(6)

(8)

 $(4 \times 4 = 16)$

Maximum Marks : 80 Min. Passing Marks : 26 3. Calculate the quantity of earthwork for a portion of a road from the following data.

(16)

Formation width of road = 10 m

Side slope = 2:1

Assume there is no transverse slope.

Use prismoidal formula

Distance in M	0	100	200	300	400	500	600	
R.L of ground	114	114.50	115.25	115.75	116.40	116.85	118	
R.L of formation	115	upw	ard grad	lient 1 : 1	200			

OR

3.	a)	What are the factors to be considered for the preparation of detailed estimate.
	b)	(4) Explain the role of a valuer in a society.
	c)	Describe "Bar Bending Schedule". (6)
		Unit - IV
4.	a)	Describe work charge establishment in detail. (8)
	b)	Discuss various factor affecting the cost of the work. (8)
		OR
4.	Wri	te short notes on the following: $(4 \times 4 = 16)$
	a)	Measurement Book b) Over head charges
	c)	Work charge establishment d) Travelling Allowance
		Unit - V
5.	a)	What is depreciation? State and explain methods of calculating depreciation.
	1)	(0)

b) The owner of property gets a net annual income of 42500/- that he invests at 6% interest. At the end of 10 years he carries out certain repairs at the cost of Rs. 1,20,000/-. He then gets an offer from a buyer to purchase the property for Rs. 5,00,000/-. Determine who is at advantage owner or buyer? (8)

OR

- 5. Write a short note on following :
 - a) Rent fixation of buildings
- b) Sinking fund

b) Year's purchase

d) Lease Hold property.

(4×4=16)

	Roll No.	11	[Total No. of Pages : [.
0	Listin and star provided by	5E5065	
N	B.Tech. V Semester (nination, Nov./Dec 2017	
ß		Civil Engineering	
4	50	E5A Building Des	ign
	Story III Standard Stand		

27/11

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. IS 1893 - Part I 2. IS 875 Part III

Unit - I

1.	a)	What do you understand	by symmetry a	and Asymmetry in	building form? (4)
----	----	------------------------	---------------	------------------	------------------	----

- b) Describe the shear wall. What are the function of shear wall. (6)
- c) What are the tube in tube structure of high rise buildings? (6)

OR

- 1. a) What do you understand by over turning in a building. (4)
 - b) Write the contributory area principle of load flow from slab to supporting beam? (6)
 - c) What is building configuration? Explain various configurations in building? (6)

Unit - II

2. Calculate wind load on rectangular clad building with mono slope roof with over hangs. Consider height (h) = 5.0 m, width (w) = 10m, length (l) = 20 m, roof angle $\alpha = 20^{\circ}$ and overhang = 0.5 m, ground is flat, life of building 25 years, terrain category - 2, and building is constructed at surat. (16)

OR

Calculate wind load on walls and roof of a rectangular clad building having pitched roof and located in a farm house, height of building is 4.0m, width 12 m and length 20m. Roof angle 10°, opening in wall = 10%, over hangs on either side is 0.5m, Building is located in Hyderabad.

Unit - **III**

3. Calculate earthquake load on a 6 storey R.C. framed building with live load of 4.0 KN/m^2 on floors. Building is having 2 bays in X direction and 3 bays in Y direction, storey height is 3.0m, all beams of 230×400 mm and columns 375×500 mm sizes. Floor thickness 100mm and walls of 230mm. Building is situated in seismic zone V and constructed for communication centre and is resting on rocky ground. Configuration of building is of special moment resisting frame. (16)

OR

- 3. a) What do you understand by centre of mass and centre of rigidity? (4)
 - b) Calculate force in given frame building with following data. (12)
 - i) Column size = 375×375 mm
 - ii) Beams size $= 300 \times 375$ mm
 - iii) Brick wall thickness = 150 mm
 - iv) Floor thickness = 120 mm
 - v) Live load on the floor = 4.0 kN/m^2
 - vi) Storey height = 4.0 m each
 - vii) No of storeys = 5



Unit - IV

- 4. a) Write short note on ductile detailing of beam, column and beam column joint?
 - b) What are the construction practices to ensure earthquake resistance for Masonry buildings.
 (8)

5E5065

- 4. a) How do you define wall and column in a masonry building? Explain effective length of masonry wall and column? (6)
 - b) Calculate the height for a thickness of 300mm of a free standing masonry wall, subjected to wind load corresponding to 1.0 kN/m². Permitted tensile stress in masonry is 0.05 N/mm². (10)

Unit - V

- 5. a) Write a short note on mass housing and precast elements.
 - b) Calculate the stresses in shell of a cylindrical type using beam theory consider the radius of shell = 6.0 m, span = 20 m, semi central angle $\phi = 60^{\circ}$, thickness t = 75 mm. (10)

(6)

(10)

OR

- 5. a) What are the difference between folded plate and cylindrical shell. (6)
 - b) Write short notes on :
 - i) North light shell roofs
 - ii) Grid and ribbed floors

	Roll No [Total No. of Page	es : 2
5E5068	5E5068 B.Tech. V Semester (Main/Back) Examination, Nov./Dec 201 Civil Engineering 5CE6.3A Solid Waste Management	7
Time :	: 3 Hours Maximum Ma Min. Passing Ma	rks : 80 rks : 26

29/11

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	What are the main problems associated with solid waste disposal?	(8)
	b)	Explain the classification of solid waste.	(8)
		OR	

1. a) What are the goals and objectives of solid waste management? (8)

b) Describe the important characteristics of solid waste. Also discuss the factors influencing generation of solid waste. (8)

Unit - II

- a) What do you mean by onsite handling of solid waste? How is the aspect of public health and aesthetics related to it? (8)
 - b) What are the different types and materials used for storage containers? Explain with suitable sketches. (8)

OR

2. a) Explain the onsite processing methods used for solid waste. (8)

b) How do we decide the location of containers? Write down the precautions and guidelines for this purpose. (8)

Unit - III

- 3. a) What are the important steps in collection and transfer system design? (8)
 - b) Explain the equipment and labour requirement in reference to solid waste management. (8)

OR

- 3. a) Explain various methods of collection system with flow diagrams. (8)
 - b) What are the different types of vehicles being used in for collection systems?(8)

Unit - IV

4. What do you understand by sanitary land filling? How is it different from a normal land filling? How is it practiced? Explain the filling process with a neat sketch.

(16)

OR

Describe in detail the different processing techniques and methods of solid waste disposal with neat sketches. (16)

Unit - V

5.	a)	Explain the special techniques of treatment for industrial solid waste.	(8)
	b)	Describe the reuse and recycling of solid waste materials.	(8)

OR

5.	a)	How is the nature, treatment and disposal of industrial solid waste	different
		than the municipal solid waste?	(8)
	b)	Explain various methods of energy recovery from solid waste.	(8)

	Roll No.		[Total No. of Pages : 3
4		5E5064	and this data and the state of the
00	B. Tech. V Semester (Main/Back) Examination, Nov./Dec 20		ation, Nov./Dec 2017
S	Ci	ivil Engineering	
	5CE	4A Surveying - II	

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

23/11

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- a) Explain how will you determine reduced level of top of a chimney, when two instrument positions are not in same vertical plane of the chimney. Also derive related expression?
 (8)
 - b) Following reciprocal observations were made from two stations P and Q.
 Horizontal distance between two stations = 7000m

Angle of elevation from P to Q - 1°58'20"

Angle of depression from Q to P - 1°59'12"

Height of signal at P - 4.1047 m

Height of instrument at Q - 1.58 m

Height of signal at Q - 3.90 m

Height of instrument at P - 1.47 m

Find the difference in level between P and Q. Take R sin i'' = 30.88 m. (8)

OR

- a) Explain how will you determine the elevation difference between two stations by single observation. Derive expression for Elevation difference for angle of elevation. Support your answer with proper and neat sketch.
 - b) Derive expression for axis signal correction in trigonometric levelling for angle of elevation? (8)

(1)

Unit - II

- a) Enumerate the methods of setting out simple circular curve. Explain the method perpendicular offset from long chord to set out simple circular curve? (8)
 - b) Two tangents intersects at a chainage1190 m, the deflection angle being 36°. Calculate necessary data for setting out simple circular curve by Rankine's tangential angle method. The radius of curve is 300 m, take normal chord length as 20 m.

OR

- 2. a) Explain methods of computing length of transition curve?
 - b) Two straights AB and BC are connected by compound curve. If deflection angle of first curve is 40°30' and second curve is 36°24' respectively. The radius of first curve is 600 m and that of second curve is 800 m. If the chainage of intersection point is 8200 m, find the chainage of tangent points T₁ and T₂ and point of compound curvature.

Unit - III

- a) What do you understand by well conditioned triangle? What is the importance of a well conditioned triangle in triangulation? Derive the condition for a well conditioned triangle? (8)
 - b) Write different criterions for selection of a triangulation station? (8)

OR

- a) What is the necessity of a satellite station in the triangulation? How reduction to centre is done if satellite station is selected in triangulation network? (8)
 - b) Two triangulation stations A and B are 100 km apart having elevations 180 m and 450 m respectively. The intervening obstruction situated at C is 70 km from A, has elevation 245m. Ascertain if A and B are intervisible or not. If A and B are not visible then find the height of signal at B so that the line of sight must no where be less than 3 m above ground surface.

Unit - IV

- 4. a) Explain the following with examples:
 - i) Accidental errors.
 - ii) Systematic errors.
 - iii) Weight of an observation.
 - iv) Station Adjustment.
 - b) What do you understand by figure adjustment? Adjust Braced quadrilateral by method of least square, write condition equations? (8)

(8)

(8)

- What do you understand by weight of a quantity? Explain the laws of weights a) (8) with suitable examples?
 - Find the most probable values of angles A and B from following observation: b) (8)

 $A = 42^{\circ}20'30.4'' - wt. -1$ $B=36^{\circ}18'25.2''-wt.-2$ A+B=78°38′50.3″-wt.-3

Unit - V

- a) Enumerate the different astronomical co-ordinate systems. Explain one of 5. (8) them in detail.
 - Explain what do you understand by declination? Show the variation of b) declination of sun with salient values and specific dates? (8)

OR

5.	a)	Explain t	he Astronomical	Triangle'
20	al	Lapiani		

- Calculate the sun's azimuth and hour angle at a place in latitude 42°30' N, b) (8) when its declination is
 - i) 22°12'N and
 - ii) 22°12′S

(8)

4.



Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	Explain Von-Neumann architecture in detail.	(8)
	b)	What is addressing mode? Explain the direct and indirect register address	ing
		modes with suitable examples.	(8)
		OR	
1.	a)	Explain the Flynn's classification of computer.	(8)
	b)	Explain the arithmetic micro-operation in register transfer language.	(8)
		Unit - II	
2.	a)	Explain the differences between RISC and CISC computers.	(8)
	b)	Explain speed up, efficiency and throughput in pipelining.	(8)
		OR	
2.	a)	Why do we require instruction pipelining? Explain its working procedu	ire.
		Discuss the pipeline performance measures.	(8)
	b)	Draw and explain the organization of a CPU showing the connections betwee	een
		the register to a common bus.	(8)
		Unit - III	
3.	a)	Using Booth algorithm. Multiply (+14) and (-12) when the number's	are
		represented in 2's complement form.	(8)
	b)	Draw and explain flow chart for addition and substraction of floating poi	nts
		numbers.	(8)

3. Explain array multiplier with a suitable example. a) Divide 0100100001 by 11001 using restoring division algorithms. Explain the b)

Unit - IV

- 4. Explain how virtual address is translated into real address in segmented memory a) system. (8)
 - b) Briefly compare the mapping procedure used in cache memory organization.

OR

4. Give the basic cell of an associative memory and explain its operation. Show how associative memories can be constructed using the basic cell with match logic. (16)

Unit - V

- 5. Describe the data transfer method using DMA. a)
 - What are the various modes of data transfer to and from the computers system? b) Explain. (8)

OR

5. Write short note on :

steps.

- Priority interrupt a)
- **IOP** processor b)

 $(2 \times 8 = 16)$

(8)

(8)

(8)

(8)

Roll No.		[Total No. of Pages :
)	5E 5102	
B.Tech. V Se	mester (Main & Back) Examina	ation, Nov./Dec 2017
	Computer Science and Engineer	ring
	5CS2A Digital Logic Design	

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	Explain lexical elements of VHDL language with example.	(8)
	b)	Explain mixed style of modeling with example.	(8)
		OR	~ /
1.	a)	Describe the design steps of digital circuit using HDL.	(8)
	b)	Write down a behavioural style code for half subtractor.	(8)
		Unit - II	
2.	a)	Explain different kinds of subprogram with examples.	(8)
	b)	Write the differences between package and entity.	(8)
		OR	
2.	Exp	plain the following statements with one example in VHDL:	(16)
	a)	If statement	
	b)	Case statement	
	c)	Loops statement	,
	d)	Generate statement	
		Unit - III	
3.	a)	Write a VHDL code for serial adder circuit.	(8)
	b)	Write VHDL code for rising edge J-K flip-flop by using structural model	ing.(8)

		OR		
3.	a)	Explain the following : (4×2	=8)	
		i) Clock skew		
		ii) Metastable state		
		iii) Hold Time		
		iv) Set up time		
	b)	Write a short note on : (4×2	(=8)	
		i) ROM		
		ii) FPGA		
		Unit - IV		
4.	a)	Define event driven circuits and write steps for designing these circuits.	(10)	
	b)	What is meant by race-free assignments? (6)		
		OR		
4.	a)	Explain in detail essential hazards and eliminating hazards.	(8)	
	b)	Explain the procedure of state reduction of incompletely specified mac with a suitable example.	hine (8)	
		Unit - V		
5.	a)	Write short notes on : $(4\times)$	2=8)	
		i) SRAM		
		ii) Flash Memory		
	b)	What is the importance of Altera static	(8)	
		OR		
5.	a)	Why should one prefer Xilinx Virtex-II PRO?	(8)	
	b)	Explain the FPGA mapping flow with the help of flow diagram.	(8)	



] Roll No [Total No. of Pages	: 2
5E5103	5E5103 B.Tech. V Semester (Main/Back) Examination, Nov./Dec 2017 Computer Science 5CS3A Telecommunication Fundamentals CS, IT	

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

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Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	Draw and explain TCP/IP reference model in computer n communication.	etwork (10)
	b)	Differentiate between Analog and Digital transmission.	(6)
	,	OR	
1.	a)	What are lossless and lossy channels? Also explain transmission impain detail.	airments (8)
	b)	Explain sliding window protocols.	(8)
	-)	Unit - II	
2	3)	Discuss channel allocation problem in MAC sublayer.	(8)
4.	a) b)	What is two dimensional parity check?	(8)
	-)	OR	
2	2)	Compare and discuss the throughput of pure and slotted ALOHA.	(8)
4.	a) b)	What is HDLC in data link control?	(8)
	,	Unit - III	
3.	a)	Explain 802.11 architecture.	(8)
	b)	What is virtual LAN?	(8)
5F	25103	3/2017 (1)	[Contd

		OR	
3.	a)	Explain spanning Tree protocol in detail.	(8)
	b)	Explain Bluetooth Architecture & protocol stack.	(8)
		Unit - IV	
4.	a)	What is multiplexing? Explain FDM & TDM in detail.	(10)
	b)	Discuss TDMA Burst structure.	(6)
		OR	
4.	a)	What is switching? Explain space-time-space division switching in	n detail.(10)
	b)	What is slip rate in digital terrestrial network.	(6)
		Unit - V	mpul
5.	a)	What is frequency hopping (FHSS)?	(8)
	b)	Differentiate between forward and reverse CDMA channel.	(8)
		OR	
5.	Wri	te short notes on :	$3 \times 2 = 16$)
	a)	IMT – 2000	

b) Orthogonal code & Gold sequences

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51	B.Tech. V Semester (Main/Back) Examination, Nov./ Dec 2017		
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Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

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11	nit	-	
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1.	a)	Explain advantage of DBMS over file system.	(8)
	b)	Discuss types of DBMS.	(8)
		OR	
1.	a)	Draw and explain architecture of RDBMS.	(10)
	b)	Contrast between DDL and DML.	(6)
		Unit - II	
2.	Dra ER	w ER diagram of any one of the following and explain each compone diagram.	nt of this
	Libi	rary management system.	(16)
		OR	
2.	Inve	entory management system.	(16)
		Unit-III	
3.	Exp	lain following operations in Relational algebra :	4×4=16)
	a)	Selection	
	b)	Projection	
	c)	Join	
	d)	Rename	
			×

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(1)

[Contd....

3.	a)	Explain the difference between relational Algebra and relational calcu	ulus. (8)
	b)	State the difference between tuple and Domain relational calculus.	(8)
		Unit-IV	
4.	Wri	ite SQL queries for following operations :	4×4=16)
	a)	Create student registration table and insert records in it.	
	b)	Update records based on a key.	
	c)	Display name and Roll numbers of students who have scored more t marks.	han 60%
	d)	Delete records and table.	
		OR	
4.	a)	Explain Triggers with the help of suitable example.	(8)
	b)	Explain Aggregate operators.	(8)
		Unit - V	
5.	a)	Explain functional dependencies with the help of suitable examples.	(10)
	b)	Discuss need of normalization.	(6)
		OR	
5.	a)	Explain 3 rd NF with suitable example.	(8)

OR

b) Explain BCNF with suitable example. (8)

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(2)



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Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1 . .

	a)	system in detail.	(8)
	b)	Explain the architecture of operating system with neat and clean d	iagram. (8)
		OR	
l.	a)	What you mean by process and lifecycle of process. Explain contex between two processes.	tt switching (8)
	b)	What you mean by thread? Explain kernel and user level thread.	(8)
		Unit - II	
2.	a)	What you mean by scheduling? Why scheduling is required? Diffe Preemption & Non-Preemption Scheduling?	rentiate the (8)
	b)	Write short notes on the following :	$(2\times 4=8)$
		i) Eain chang ach a duling	

1) Fair share scheduling

ii) Race condition

iii) Critical section

iv) Semaphore and mutex

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(1)

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Consider the following four processes, with the length of the CPU burst time given in milliseconds. (16)

Process	Burst time (ms)	Arrival time (ms)
P0	15	0.0
P1	20	1.0
P2	3	2.0
P3	7	2.0

Consider the Shortest Remaining Time First (SRTF), Round Robin (RR) (Quantum = 5ms) scheduling algorithms. Illustrate the scheduling using Gantt chart. Which algorithm will give the minimum average waiting time?

Unit - III

- 3. a) What is deadlock? Explain the conditions and prevention of deadlock? (4)
 - b) What is deadlock avoidance? Explain banker's algorithm with following SNAPSHOT of a system? Resource A = 3, B = 14, C = 12 and D = 12 instances. If P1 request 1 0 2 1 resource instance It can be granted or not?(12)

	-	Alloc	ation	I		Ma	axim	um	Available				
40.1	A	B	C	D	A	В	C	D	A	B	С	D	
P0	0	0	1	2	0	0	1	2	1	5	2	0	
P1	1	0	0	0	1	7	5	0					
P2	1	3	5	4	2	3	5	6					
P3	0	6	3	2	0	6	5	2					
P4	0	0	1	4	0	6	5	6					

OR

- 3. a) What is memory allocation schemes? Explain with example.
 - b) What is thrashing? What do you understand by degree of multiprogramming.(8)

Unit - IV

- 4. a) What you mean by paging? Explain the concept of demand paging with proper diagram.
 (8)
 - b) What is fragmentation? Differentiate between external and internal fragmentation.
 (8)

OR

Explain the FIFO, Optimal, LRU page replacement algorithm for the reference string. (16)

5E5105

(8)

Unit - V

5.	a)	Explain various disk scheduling algorithm in brief.	(8)
	b)	What are the various access methods for file system.	(8)

OR

- 5. What do you mean by disk scheduling? Suppose the head of moving head disk is currently servicing s request at track 60. If the queue of request is kept in FIFO order. What is the total head movement to satisfy these requests for the following disk scheduling algorithm: (16)
 - i) FCFS
 - ii) SCAN
 - iii) C-SCAN

REQUEST SEQUENCE	TRACK NUMBER
1	55
2	175
3	30
4	125
5	10
6	140

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ESI	B.Tech. V Semester (Main/Back) Examination, Nov./Dec 2017 Computer Science
5	5CS6.1AAdvanced Data Structure
101-	CS, IT

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Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

 Define Red-black trees. What is "big-oh" performance for the operation find Insert and Remove for a Red-black tree in best, worst & average cases. (16)

OR

- 1. a) Explain the operations on weighted balanced trees in detail. (10)
 - b) Write short note on Dynamic order statistics.

Unit - II

2. Explain the implementation of a binomial heap and its operations with suitable example in detail. (16)

OR

Explain Amortization analysis and potential function of fibonacci heap along with implementation of fibonacci heap. (16)

Unit - III

- 3. Explain following in contrast to Graphs
 - a) Cut sets (5)
 b) Vertices Planar & Dual graphs (5)
 c) Spanning Trees (6)

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(1)

[Contd....

(6)

OR

Write and explain single Min-cut Max-flow theorems in Network flows. 3. a) (8) Explain ford fulkerson max flow algorithm. b) (8) Unit - IV Explain the concept of priority queues and concatenable queues using 2-3 Trees 4. along with suitable example. (16)OR Explain various operations on Disjoint sets and its union find problem. (10) 4. a) Write short note on zero-one example. b) (6) Unit - V 5. Explain notation of elementary number theorem also explain Division a) theorem. (10)Write short note on Chinese Reminder Theorem. b) (6)OR Write short notes on : Primality testing & Integer factorization. a) (8) Computation of Discrete logarithms. b) (8)

5.

	EC	16/11
Roll No.	· ·	[Total No. of Pages : 2
	5E5021	
B.Tech. V	Semester (Main&Back) Examin	ation, Nov./Dec 2017
E	lectronic Instrumentation & Cont	trol Engg.
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ne: 3 Hours	apenies of Fourier Inastoria along	Maximum Marks :

Min. Passing Marks : 26

 $(4 \times 4 = 16)$

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

Differentiate following: 1.

- Continuous-time and discrete-time signals. a)
- Continuous-valued and discrete-valued signals. b)
- Multichannel and Multidimensional Signals. c)
- d) Deterministic and Random Signals.

OR

For the following input output relationships, determine whether the corresponding 1. system is linear or not

a) $y(t) = x^2(t)$	(8)
b) $v(n) = 2x(n) - 3$	(8)

y(n) = 2x(n) - 3b)

Unit - II

Write and Explain all the properties of Continuous-Time Fourier series. (16)2.

OR

- Given the Periodic waveform x (t) = t^2 , 0 < t < 1 Determine the exponential 2. a) Fourier series and plot the magnitude and phase spectra. (8)
 - Find the time-domain signal corresponding to the Discrete Periodic waveform b) $X_{\mu} = \cos(k4\pi/11) + 2j\sin(k6\pi/11).$ (8)

5E5021/2017

		Unit - III	
3.	Fi	ind the Fourier transform of the following :	
	a)	$x(t) = \cos(\omega_0 t)$	(5)
1	b)	Unit step function u (t)	(5)
	c)	Continuous time signal x (t) = e^{-at} u (t), a > 0	(6)
		OR	(0)
3.	Ex	xplain the following properties of Fourier transform along with proof	
	a)	Convolution property	(5)
	b)	Modulation property	(5)
	c)	Duality	(6)
AT SE		Unit - IV	(•)
4.	De	etermine the Laplace transform of	
	a)	A unit Impulse function $x(t) = \delta(t)$	(5)
	b)	A unit step function $x(t) = u(t)$	(5)
	c)	A unit ramp function $x(t) = r(t)$	(6)
		OR	(-)
4.	a)	Write and Explain the Initial value theorem and final value theorem with r	proof.
	1.)	a) "all omitidente-finet and discrete-dutic signals.	(8)
	D)	Determine the Z–Transform of the following:	
		1) $x(n) = -u(-n-1)$	(4)
		11) $x(n) = u(-n)$	(4)
=	C.	Unit - V	
э.	Spe	city the Nyquist rate and Nyquist interval for each of the following signal	S
•	a)	$x(t) = \operatorname{sinc} (200t)$	(5)
	D)	$x(t) = sinc^2 (200t)$	(5)
	C)	$x(t) = sinc(200t) + sinc^2(200t)$	(6)
=	Г	OR	
3.	Exp	Dain following in detail.	
	a)	Sampling of sinusoidal signals.	(8)
	D)	Sampling theorem for Low-pass signals.	(8)

Roll No. ______ [Total No. of Pages : 4 5E5022 B.Tech. V Semester (Main/Back) Examination, Nov./Dec. - 2017 Electronics And Communication Engineering 5EC2A Linear Integrated Circuits (Common with EI)

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

18/11

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

- a) A differential amplifier has differential gain = 40 dB and CMRR = 60 dB. Find the output and percent error in following cases.
 (8)
 - i) Input $v_1 = 40 \ \mu v$ and $v_2 = -40 \ \mu v$
 - ii) Input $v_1 = 800 \ \mu v$ and $v_2 = 880 \ \mu v$
 - b) In a differential amplifier the performance is depends on emitter resistance R_E and it must be as high as possible, but passive resistance of High value is not possible in ICs. Give the different schemes for obtain a large value of R_E electronically by active components. (6)
 - c) How slew rate can be controlled by external components in an Op-Amp? (2)

OR

- 1. a) Draw and explain the practical circuits used for measure following Op-Amp parameter (4×2.5=10)
 - i) Input offset voltage
 - ii) Slew rate
 - iii) Common mode rejection ratio (CMMR)
 - iv) Bias current I_{R}

b) For the differential amplifier shown in fig. - I.





Determine

- i) Differential voltage gain
- ii) Input resistance and
- iii) Q-point

Unit - II

- **2.** a) For the inverting amplifier shown in fig-2.
 - i) Calculate voltage gain and input resistance
 - ii) Output voltage when input voltage = 10 mV.



- b) Draw the OP-Amp circuits to obtain.
 - i) Precision full wave rectifier.
 - ii) Wein bridge oscillator with oscillation frequency 20 kHz.

(2)

(8)

(8)

 $(3 \times 2 = 6)$

a) Design OP-Amp circuit to give output

2.

)
$$V_0 = 3V_1 - 2V_2 + 5V_3 - 8V_4$$
.

ii)
$$V_0(s) = \frac{10}{(100s+1)} V_i(s)$$
.

- b) Draw and explain following Op-Amp circuits
 - i) Frequency to voltage converter.
 - ii) Voltage to frequency converter.
 - iii) Square wave generator for generate a clock of 10 kHZ.

Unit - III

- 3. a) Design a low pass first order Butterworth filter with cutoff frequency 40 kHZ and Mid band gain of 10.
 (8)
 - b) For the active filter shown in Fig. -3 calculate the cutoff frequency and midband gain. Also draw the frequency response.
 (8)



- a) What is switched capacitor filter? Realize a low pass filter with such filter and op-amp.
 b) D = d = 1
 - b) Draw the phase shift of filter shown in fig. 4. Also calculate the phase shift in a input signal. $v_i = 10 \sin (1000t + 45^\circ)$ (6)



c) Draw the Notch filter and define its Quality factor.

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(3)

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(4)

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(2+2+4=8)

(4+4=8)

Unit - IV

4. a) Draw and explain the working of a series regulator and How it can be improved?

(8)

(8)

(8)

b) Draw the waveform in circuit (fig. 5).



OR

4. a) Calculate the UTP and CTP of a Schmitt trigger shown in Fig-6. Also draw the output waveform when input is $v_i = v_0 \sin wt$. (8)



b) Draw the circuit diagram of Monostable Multivibrator using IC-555. Also draw its waveform. (8)

Unit - V

- 5. a) Draw Op-Amp circuit to solve the differential eq. 20y'' + 0.1y' + 2 = F(t).(8)
 - b) Draw circuit of FM detector using PLL and explain its working. (8)

OR

- 5. a) Define lock range and capture range of a PLL find their general expression. (8)
 - b) Draw and explain the working of Anti-log amplifiers.

**



Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

- 1. a) Discuss the different types of transmission lines and their applications. (8)
 - b) A telephone line has R = 30 Ω / km, L = 100 mH/km, G = 0, and C = 20 μ F/km. At f = 1 kHz, obtain :
 - i) The characteristic impedance of the line (4)

ii) The propagation constant

OR

- 1. a) What are the different types of losses in transmission lines? Explain them.(8)
 - b) For a transmission line which is terminated in normalized impedance Zn, VSWR = 2. Find the normalized impedance magnitude. (8)

Unit - II

- 2. a) Describe the smith chart and its application in analysis of transmission lines.(8)
 - b) A transmission line has a characteristic impedance of $50 + i0.01 \Omega$ and is terminated in a load impedance of $73 i42.5 \Omega$. Calculate
 - i) The reflection coefficient (4)
 - ii) The standing wave ratio

(4)

(4)

OR

- 2. a) Describe the single and double stub matching. (8)
 - b) A lossless transmission line operating at 4.5 G Hz has $L = 2.4 \mu$ H/m and $Zo = 85 \Omega$. Calculate the phase constant β and phase velocity μ . (8)

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		Unit - III	
3	• a)) Describe the constant k-filters.	(10)
	b) What do you mean by symmetrical and a symmetrical two port Explain them	networks?
			(6)
3	2)	Desire	
5.	a)	Design a m-derived T-section low pass filter having cut-off f fc = 1000 Hz, design impedance $R_k = 600 \Omega$ and frequency c	frequency of infinite
		attenuation $f_{\infty} = 1050 \text{ Hz}.$	(8)
	b)	Describe the π -section and T-section attenuators.	(8)
		Unit - IV	(0)
4.	a)	What do you understand by cross talk? How it can be reduced?	(10)
	b)	Discuss the following :	(10)
		i) Traffic unit	(6)
		ii) Grade of service	
		iii) Busy hour	
4.	a)	Explain the frequency division and (in the intervence)	
	b)	Describe acho suppose	(8)
	0)	Deserve echo suppressors.	(8)
5	Dee	Unit - V	
э.	Des	scribe the following :	
	a)	EPABX	(8)
	b)	SPC digital telephone exchange	(8)
		OR	(0)
5.	Des	cribe the following :	
	a)	Fascimile services	(0)
	b)	STS & TST switches	(8)
		reminated in a load unpedance of 73 - (42.532. Calculate	(8)
		the the	

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Time : 3 Hours

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Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- a) Noise and other types of signal power needs to be expressed in two commonly used units of dBW and dBm which are absolute units of power compared to 1W and 1m W respectively.
 (10)
 - i) Change the powers into dBW and dBm : 470mW; 1W& 100nW
 - ii) Change the powers into watts : -20dBW; 47dBm; 0dBm
 - b) Prove that the effective noise temperature of k 2 port networks in cascade is

$$\Gamma e = T e_1 + \frac{T e_2}{G_1} + \frac{T e_3}{G_1 G_2} + \dots + \frac{T e_k}{G_1 G_2 \dots G_k}$$
(6)

OR

- 1. a) i) An electrical communication system uses a channel that has a 20dB loss. Estimate the received power if the transmitted power is 1W.
 - ii) The channel interfaces in a point-to-point communication system attenuates the signal by 3dB each. The channel loss is 30dB. If the received signal is to be amplified such that the over all loss is limited to 20dB. Find the amplifier gain.
 - b) Explain using mathematical equation noise temperature and noise figure in communication systems.
 (8)

Unit - II

- a) Explain with suitable sketch and plot the generation of SSB. Signals using phase shift method.
 (8)
 - b) A DSB modulated signal $\phi(t) = A$ mt cos 2π fet is multiple with a local carrier $c(t) = \cos(w_c t + \theta)$ and the output is passed through a LPF with a bandwidth equal to the bandwidth of the message m(t). If the power of the message signal m(t) is P_m determine. (8)
 - i) The power of the modulated signal.
 - ii) The power of the signal at the output of the LPF.

OR

- 2. a) With the help of neat sketch explain how VSB signals are generated. (6)
 - b) When a sinusoidal test tone of frequency Wm(in radian) is applied to the input of the modulation in Ang broad casting (DSB with full carrier). the modulated waveform is as shown in figure 1. Where the carrier frequency is W_c. (10)





- ii) Determine the total Average power of the modulated signal the carrier power the USB power and the LSB power (assume unit load)
- iii) Determine the modulation efficiency.
- iv) What is the peak envelop power accross the 60Ω load.

Unit - III

- 3. a) An angle modulated signal is described by $X_c(t) = 10 \cos [2\pi (10^6)t + 0.1 \sin (10^3)\pi t]$ (8)
 - i) Considering $X_{c}(t)$ as a PM signal with $k_{p} = 10$ find m(t)
 - ii) Considering $X_c(t)$ as an FM signal with $k_f = 10\pi$. Find m(t).
 - b) Define frequency and phase modulation and explain the relation between them.

(8)

5E5024

(2)

OR

a)	What are the effects of channel non-linearity.	(4)
b)	Compare AM, FM and PM and tabulate their performance.	(6)
c)	Explain with neat sketch. FM broad casting transmitter and Receiver.	(6)
	Unit - IV	
a)	With the help of mathematical expression, explain the SNR calculation synchronous detection of DSB.	for (8)
b)	What is pre-emphasis & de-emphasis? How it is help full in communicat system.	ion (8)
	OR	
a)	What is threshold effect?	(4)
b)	How is an angle modulation system SNR is calculated?	(6)
c)	What are internal noises in a communication systems? Explain in brief.	(6)
	Unit - V	
a)	Compare and tabulate. Natural and flat top sampling.	(8)
b)	With the help of neat sketch explain how PPM. modulation and demodulation is done.	ons (8)

OR

(8)

5.	a)	Explain what do you understand by noise performance of pulse A	Analog
		Modulation system. How it is calculated mathematically?	(8)

b) How PWM signal are reconstructed at the receiver side? (8)

3.

4.

4.

5.

	Roll No.	Il time!	[Total No. of Pages :
4		5E5024	
0	B.Tech. V Semester (M	lain/Back) Examin	ation, Nov./Dec 2017
	Electronics &	Communication En	gineering
-1	Literi onies et		5

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

0111

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- a) Noise and other types of signal power needs to be expressed in two commonly used units of dBW and dBm which are absolute units of power compared to 1W and 1m W respectively. (10)
 - i) Change the powers into dBW and dBm : 470mW; 1W& 100nW
 - ii) Change the powers into watts : -20dBW; 47dBm; 0dBm
 - b) Prove that the effective noise temperature of k 2 port networks in cascade is

$$Te = Te_1 + \frac{Te_2}{G_1} + \frac{Te_3}{G_1G_2} + \dots + \frac{Te_k}{G_1G_2\dots G_k}$$
(6)

OR

1.

a)

i) An electrical communication system uses a channel that has a 20dB loss. Estimate the received power if the transmitted power is 1W.

- ii) The channel interfaces in a point-to-point communication system attenuates the signal by 3dB each. The channel loss is 30dB. If the received signal is to be amplified such that the over all loss is limited to 20dB. Find the amplifier gain.
- b) Explain using mathematical equation noise temperature and noise figure in communication systems. (8)

STIR	Roll No [Total No. of Pages :
52	5E5025
50	B.Tech. V Semester(Main/Back) Examination, Nov./Dec 2017
F	Electronics & Communication Engineering
n	5EC5A Microwave Engg I

2711

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- 1. a) Discuss the following in a rectangular waveguide,
 - i) Degenerate mode
 - ii) Dominant mode

(4 + 4 = 8)

- b) An air-filled rectangular waveguide of inside dimensions 7×3.5 cm operates in the dominant TE₁₀ mode.
 - i) Find the cutoff frequency.
 - Determine the phase velocity of the wave in the guide at a frequency of 3.5 GHz.
 - iii) Determine the guided wavelength at the same frequency.

(2+3+3=8)

OR

1. a) A shielded stripline has the following parameters Dielectric constant of the insulator, $\in_r = 2.56$

Strip width, w = 25 mils

Strip thickness, t = 14 mils

Shield depth, d = 70 mils

- i) The K factor.
- ii) The fringe capacitance.
- iii) The characteristic impedance of the line.

(2+2+2=6)

b) A loss less parallel stripline has a conducting strip width w. The substrate dielectric separating the two conducting strips has a relative dielectric constant \in_{rd} of 6.0 (B_oO) and a thickness d of 4.0 mm.

Calculate:

- i) The required width, w of the conducting strip in order to have a characteristic impedance of 50Ω .
- ii) The strip-line capacitance.
- iii) The strip-line inductance.
- iv) The phase velocity of the wave in the parallel stripline.

 $(2^{1/2} \times 4 = 10)$

Unit - II

- a) Derive the expression for average power flowing into the port-n of a n-port network, in terms of parameters proportional to incident wave and outgoing wave.
 - b) Derive the following in terms of S-parameters when the ports are matched terminated in two port network.
 - i) Insertion loss.
 - ii) Transmission loss.
 - iii) Reflection loss.
 - iv) Return loss.

OR

- 2. Discuss the following properties of S-parameters.
 - i) Zero property of [S] matrix.
 - ii) Unity property of [S] matrix.
 - iii) Symmetric property of [S] matrix.
 - iv) Phase shift property of [S] matrix.

 $(4 \times 4 = 16)$

 $(2 \times 4 = 8)$

5E5025

(2)

3. Discuss the [S] matrix of a directional coupler. A symmetric direction coupler with infinite directivity and a forward attenuation of 20 dB is used to monitor the power delivered to a load Z_1 , as per fig (1) Bolometer-1 introduces a VSWR of 2.0 on arm 4; bolometer-2 is matched to arm 3. If bolometer-1 reads 8mW and bolometer-2 reads 2mW, find (a) the amount of power dissipated in the load Z_1 ; (b) the VSWR on arm 2.



$$(4 + 6 + 6 = 16)$$

OR

- 3. With the help of a diagram, explain the following microwave components,
 - i) Wilkinson Power Divider
 - ii) Ring Resonator
 - iii) Backward wave coupler

(5+5+6=16)

Unit - IV

- 4. a) With the help of diagram, discuss an arrangement to measure low microwave power within 1 to 10 mW range. (8)
 - b) Draw and explain the block diagram of set-up for the measurement of VSWR at the input of the component under test. (8)

OR

a) What are the types of network analysers. Explain any one of them with the help of suitable block diagram. (8)

(3)

b) Discuss how measurements are made using a noise-figure meter. (8)

Unit - V

Resistive film thickness, $t = 0.1 \mu m$.

Resistive film length, l = 10 mm

Resistive film width, w = 10 mm

Sheet resistivity of gold film, $\rho = 2.44 \times 10^{-8} \Omega$ -m.

Calculate the planar resistance and also draw the diagram of a thin film resister. (5 + 3 = 8)

b) An interdigitated capacitor fabricated on a GaAs substrate has the following parameters,

Number of fingers, N = 8

Relative dielectric constant of GaAs, $\epsilon_r = 13.10$

Substrate height, h = 0.254 cm

Finger length, l = 0.00254 cm

Finger base-width, w = 0.051 cm

Compute the capacitance.

OR

- 5. a) Describe the MMIC techniques and also list the basic materials for MMIC.(8)
 - b) Explain the photolithography process with the help of suitable diagram. (8)

(8)



	Roll No. [Total No. of Pages : 2]
26	5E5026
20	B.Tech. V Semester (Main/Back) Examination, Nov. /Dec 2017
E	Electronics & Communication Engg.
N	5EC6.1A Biomedical Instrumentation

29/11

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

Write and Explain the description of neural, muscular, cardiovascular and respiratory systems of human body subsystems along with their electrical and mechanical activities in detail. (16)

OR

1.	a)	Explain the Principles and classification of transducers for Bio-mapplications.	edical (10)
	b)	What is the Selection criteria for transducers and electrodes.	(6)
		Unit - II	
2.	a)	What do you mean by Electrical activity of excitable cells. Explain.	(8)
	b)	Write a technical note on ECG in detail.	(8)
		OR	
2.	Exp	plain following terms incorporated with Cardiovascular system Measurem	nent
	a)	Blood pressure	(4)
	b)	Blood flow	(4)
	c)	Cardiac output	(4)
	d)	Cardiac rate	(4)

5E5026 /2017

(1)

Unit - III

- a) Explain the working principle for measurement of partial pressure of Oxygen (P02) in the blood and describe suitabel scheme for it. (10)
 - b) Explain the working principal of Spectrophotometers.

OR

- 3. Write short notes on:
 a) Diagnostic X-Rays
 b) MRI
 (5)
 - c) Ultrasonography

Unit - IV

- 4. a) What are the various elements of an Intensive Care Unit (I.C.U)? Explain each element in brief. (8)
 - b) Explain various methods of electrical accident prevention in medical instrumentation systems. (8)

OR

4. What is the requirement of Therapeutic and Prosthetic Devices. Explain the working of cardiac pacemakers, defibrillators in detail. (16)

Unit - V

- 5. a) What do you understand by Atrial abnormalities. Explain in detail. (10)
 - b) Write and explain the advantages of remote data recording and management.

(6)

(6)

(6)

OR

5. a) Write a short note on Ventricular enlargement. (4)
b) Write and explain Clinical applications of EEG, EMG and ERG. (12)

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Roll No.		[Total No. of Pages :
he belo of example	5E3113	-969
B.Tech. V	Semester (Back) Examinat	tion, Nov./Dec 2017
Elect	tronics & Communication E	ngineering
51	EC6.2(O) Advanced Data Str	ructures

Time : 3 Hours

1

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable by assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- a) Explain briefly the representation of 2-3 trees with example. Explain its insert and delete operations. (8)
 - b) What is a dictionary? Give the applications of dictionary. (8)

OR

1. Explain Huffman trees in detail. Suppose we are given the following table of letter frequencies.

a	b	c	d	e	f
1	2	3	4	5	6

Create a Huffman coding tree for this table.

Unit - II

- 2. a) What is Binomial heap? Explain binomial operations and its applications. (8)
 - b) Explain mergeable heap operations.

OR

- 2. a) Explain 2-3-4 Trees with the help of an example. Explain the function of insertion and deletion with an example. (12)
 - b) Write short note on Fibonacci Heap.

(4)

(16)

(8)

Unit - III

OR

Explain spanning tree. Explain Kruskal's algorithm with the help of example. (16)

		and arese terms (any two)		(16)
	a)	Isomorphic components		()
	b	Cut vertices	whole is	
	c)	Planer and dual graph		
		Unit - IV		
4.	W	rite short notes on :		
	a)	Breadth first search		
	b)	Depth first search		(4)
	c)	Topological sort		(4)
	d)	Articulation point		(4)
		OR	ittilgziski (j Jah Julie	(4)
4.	a)	Explain briefly algorithms for connectedness		
	b)	Write short note on strongly connected components		(8)
		Unit - V		(8)
5.	a)	Write and explain single Min-cut Max flow algorithm		
	b)	Explain all pair shortest path algorithm.		(8)
		OR		(8)
5.	Wri	te short notes on (any two) :		14.5
	a)	Ford fulkerson max flow algorithm		(16)
	b)	Single source shortest path algorithm		
	c)	Sorting network for flow		

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.3.

3.

Define these terms (any two)

(2)



Total No. of Questions:

Total No. of Pages:

Roll No.

B.Tech. V-Sem (Main/Back) Exam Nov. 2017 Electronics and Communication Engineering 5EC6.2A Advance Data Structure 5E5027

Time: 3Hours

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Maximum Marks: 80 Min Passing Marks: 26

2.

Attempt any **five questions**, selecting **one question** from **each unit**. All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

1____

UNIT -I

Q. 1 a) What is time complexity? Explain with the help of exampleb) What is asymptotes notations? Differentiate between big oh ,theta and big omega.

OR

Q.1 Write the short note on template functions and class templates

16

P.T.O.

8+8=16

UNIT -II

Q. 2 a) Explain why re-black trees make good search trees
 b) Explain the concept of balanced tree. Write pseudo code for insertion and deletion from AVL tree.

OR

Q.2	below.
	In order : EACKFHDBG
	Pre order: FAEKCDHGB
	b) What is stack? Write algorithm to insert an element stack and delete an element from a stack with example
	8+8=16
	UNIT -III
03	a) Explain granning tree along with the install
Q. 5	b) Write short note on double hashing
	8+8= 16
~ ~	OR
Q.3	Explain BFS and DFS traversal in detail
	16
	UNIT -IV
Q. 4	What is garbage collection in data structure ? Explain garbage collection algorithm for
	equal sized blocks. 16
0.4	OR
Q.4	write a short note on :
	a) Storage allocation for objects with mixed sizes
	b) Storage compection 8+8=16

UNIT -V

Q. 5 ₄a)Sort the following data in ascending order using quick sort 9 4 12 6 5 10 7 b) Explain dynamic programming.

8+8=16

OR a) Write a algorithm for merge sort and comment on its complexity b) What is sorting? Explain internal and external sorting algorithms. Q.5

8+8=16

Roll No.		[Total No. of Pages :
	5E5042	
B.Tech. V Sem	ester (Main&Back) Examin	nation, Nov./Dec 2017
	Electrical Engineering	
5EE2A M	icroprocessors & Computer	r Architecture

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

[Contd....

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	Explain the following terms with respect to 8085 Microprocessor.	(8)
		i) Address bus ii) Data bus iii) Control bus	
	b)	Describe the Architecture of 8085 Microprocessor.	(8)
		OR	
1.	a)	Describe the memory organization? Also explain various types of Interrup	ts. (8)
	b)	Explain the various types of Signals and Pins used in 8085 Microprocesso	or? (8)
		Unit - II	
2.	a)	What are Subroutines? How they are useful?	(8)
	b)	Explain MVI and LXI instructions using suitable example?	(8)
		OR	
2.	a)	Explain the Classification of the instruction set of 8085 microprocessor w suitable example.	ith (8)
	b)	Write short note on Counters & Time delay.	(8)

		Unit - III	
3.	Ex	xplain the 8279 to be used with the 8085 microprocessor?	(16)
		OR	
3.	a)	Draw and explain the block diagram of 8257 DMA controller?	(8)
	b)	Draw and explain the block diagram of 8155 multipurpose programm device. How does it differ from 8255.	able (8)
		Unit - IV	
4.	a)	Give a brief discussion on Instruction set of 8086 microprocessor?	(8)
	b)	Explain Hardware and Software interrupts of 8086 microprocessor.	(8)
		OR	
4.	a)	Explain the memory addressing and memory segmentation for 8 Micro-processor?	086 (8)
	b)	Explain the Architecture of INTEL 8086?	(8)
		Unit - V	
5.	a)	Explain the following types of memory-	(8)
		i) Volatile and non volatile memory.	
		ii) Virtual and physical memory.	
	b)	Write short note on :-	(8)
		i) RD RAM	
		ii) DD RAM	
		OR	
5.	a)	Explain the central processing Unit with the help of diagram. Also explain need and applications?	its (8)
	b)	Write short notes on:	(8)
		i) Different types of ROM	(-)
		ii) Memory Latency and Memory seek time	

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(2)

	Roll No [Total No. of Pages : 2
26	5E3126
1	B.Tech. V Semester (Back) Examination, Nov./Dec 2017
E	Electrical Engineering
51	5EE4(O) Generation of Electrical Power

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

18/11-

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable by assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- 1. a) Explain Basic Scheme and working Principal of a Thermal Power Plant?
 - b) With respect to Nuclear Power Plant explain phenomena of Nuclear Fission.

(8+8=16)

OR

a) Explain the basic Scheme of Pumped Storage plant by help of neat diagram?
b) By help of labeled diagram explain working of closed cycle gas turbine plants?

(8+8=16)

Unit - II

- 2. a) Explain the impact of Thermal power plant on our environment?
 - b) Explain the Phenomena of Greenhouse Effect in detail.

(8+8=16)

OR

- **2.** a) Explain Renewable and Non Renewable energy source with its advantages and disadvantages.
 - b) Explain how electricity can be generated by help of a wind power plant also state its pros and cons? (8+8=16)

Unit - III

- 3. a) Explain causes and effects of low power factor and advantages of improving it.
 - b) The peak load on a 50 MW power station is 39 MW. It supplies power through four transformer whose connected load are 17, 12, 9 and 10 MW.

The maximum demand on these transformer are 15, 10, 8, and 9 MW respectively. If the annual load factor is 50% and the plant is operating for 65% of the period in the year find out :

- i) Average load on the station
- ii) Energy supplied per year
- iii) Demand factor
- iv) Diversity factor
- v) Used factor for the power station

(8+8=16)

OR

- **3.** a) Explain the method of improving power factor by help of synchronous condenser in detail.
 - b) What do you understand by the term Electrical Load? Explain Chronological load curve?

(8+8=16)

Unit - IV

- 4. Explain the following Term with respect of Power Plant Economics.
 - a) Cogeneration
 - b) Energy Conservation

(8+8=16)

OR

- 4. a) Write short note on Role of Load diversity in power system economics.
- b) Explain how capital cost, annual fixed cost and operation cost of power plant is calculated with example?

(8+8=16)

Unit - V

- 5. a) Explain the concept of Base Load and Peak Load.
 - b) Explain the factor used for selection of area for a Thermal power plant.

(8+8=16)

OR

- 5. a) Describe the Factor to be consider for, selecting land for a Nuclear power plant?
- b) What is Tariff explain how tariffs are calculated by help of a example?

(8+8=16)

(2)

5046	Roll No.	[Total No. of Pages : 3
	5E5046	
	B.Tech. V Semester (Main/Back) Examin	nation, Nov. /Dec 2017
E	Electrical Engineering	
n	5EE6.1A Optimization Tech	niques

29/11

Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Write a brief note of the following :

- i) Constraints
- ii) Linear programming problem
- iii) Geometric programming problems
- iv) Quadratic programming problems
- b) A factory produces two grades of paper namely A4 and B4. It cannot produce more than 400 tons of grade A4 and 300 tons of B4 in a week. There are 160 production hours in a week. It requires 0.2 and 0.4 hours to produce a ton of products A4 and B4 respectively with corresponding profits of Rs. 200 and Rs. 500 per ton. Formulate the linear programming problem. (8)

OR

- a) What is optimization? Explain ten engineering applications of optimization techniques.
 (8)
 - b) A company desires to devote the excess capacity of the three machines lathe, shaping and milling to make three products A, B and C. The available time per month in these machines are tabulated below :

Machine	Lathe	Shaping	Milling	
Available time per month	200 hours	110 hours	180 hours	

The time (in hours) taken to produce each unit of the products A, B and C on the machines is displayed in the table below :

(8)

Machine	Lathe	Shaping	Milling
Product A	5	2	4
Product B	2	2	Nil
Product C	3	Nil	3

The profit per unit of the products A, B and C are Rs. 20, Rs. 15 and Rs. 12 respectively. Formulate the mathematical model to maximize the profit. (8)

Unit - II

- Find the extreme points of the function $f(x, y) = x^3 + 2y^3 + 3x^2 + 12y^2 + 24$, 2. a) and determine their nature also. (8)
 - b) A rectangular sheet of metal has four equal portions removed at the corners and the sides are then turned up so as to form an open rectangular box. Show that when the volume contained in the box is maximum, the depth will be

$$\frac{1}{6} \left[(a+b) - \left(a^2 - ab + b^2\right)^{1/2} \right]$$
 where *a* and *b* are original dimensions of rectangle. (8)

rectangle.

OR

- Find the point on the plane x + 2y + 3z = 1, which is nearest to the point 2. a) (-1, 0, 1) by Lagrange's multipliers method. (8)
 - A given quantity of metal is to be caste into a half cylinder. Show that, in order b) to have minimum surface area, the ratio of the length of the cylinder to the diameter of its semicircular ends is $\pi/(\pi+2)$. (8)

Unit - III

- 3. a) Solve graphically the problem
 - Max. z = 3x + 4ySubject to 5x + 4y < 200 $3x + 5y \le 150$ 5x + 4y > 1008x + 4y > 80and $x, y \ge 0.$
 - b) Find the dual of the following LPP :

Min. $z_r = x_1 + x_2 + x_3$ Subject to $x_1 - 3x_2 + 4x_3 = 5$ $2x_1 - 2x_2 \le -3$ $2x_2 - x_3 \ge 5$ $x_1, x_2 \ge 0, x_3$ is unrestricted in sign and

(8)

(8)

5E5046

(2)

OR

3. Solve the following problem by using Big-M method :

Min.
$$z = x_1 + x_2$$

Subject to $2x_1 + x_2 \ge 4$
 $x_1 + 7x_2 \ge 7$
and $x_1, x_2 \ge 0.$ (16)

Unit - IV

4. Find the maximum of $f(x) = x(5\pi - x)$ in the interval [0, 20] by Golden section method. (16)

OR

4. State Kuhn-Tucker conditions, and apply them to solve

Minimize
$$f(x, y, z) = x^2 + y^2 + z^2 + 20x + 10y$$

Subject to $x \ge 40$,
 $x + y \ge 80$,
 $x + y + z \ge 120$. (16)

5. Minimize $f(x_1, x_2) = x_1 - x_2$

Subject to $g(x_1, x_2) = 3x_1^2 - 2x_1x_2 + x_2^2 - 1 \le 0$

Using the cutting plane method (upto two iterations). Take the convergence limit in step 5 as $\varepsilon = 0.02$. (16)

OR

5. Minimize $f(X) = x^2 + 2y^2$

Subject to $2x + 5y - 10 \le 0$

by using exterior penalty method and find solutions (in table) for r = 1,5,10,50,100,500,1000 and $r \rightarrow \infty$. (16)

	EE 16/1)
	Roll No [Total No. of Pages : 2
	5E5041
504	B.Tech. V Semster (Main/Back) Examination, Nov./Dec 2017
E	Electrical & Electronics Engineering
5	SEATA Power Electronics
Time	2 Hours Maximum Marks · 80
ime.	J HUUI S MIAAMIUM MAI KS . OU

Min. Passing Main : 26 Min. Passing Back : 24

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	Explain and draw the switching characteristics of the power IGBT.	(8)
	b)	Describe the various commutation methods of thyristor.	(8)
		OR	
1.	a)	Explain and draw the switching characteristics of the power GTO.	(8)
	b)	Explain the constructional details and working of power MOSFET.	(8)
		Unit - II	
2.	a)	Explain and draw the switching characteristics of SCR.	(8)
	b)	Explain various turn ON methods of thyristor.	(8)
		OR of the subscience of the OR of the subscience of the subsc	
2.	a)	Explain the series and parallel operation of SCR.	(8)
b) A SCR with a rating of 1000V and 200A are available to be used in handle 60 KV and 1 KA. Calculate the number of series and p required in case of derating factor is		A SCR with a rating of 1000V and 200A are available to be used in a stri handle 60 KV and 1 KA. Calculate the number of series and parallel required in case of derating factor is	ng to unit
		i) 0.1 ii) 0.2	(8)
		Unit - III	
3.	a)	Describe working of a 1 - ϕ full wave converter with RLE load through	igh a

3. a) Describe working of a $1 - \varphi$ full wave converter with RLE load through a waveform of a supply voltage, load voltage, load current and voltage across thyristor. Also derive the expressions for load voltage and output power. (8)

- b) A 1 ϕ half wave converter has resistive load 20 Ω input voltage 230 V, 50 Hz with $\alpha = 45^{\circ}$ Determine the
 - i) RMS value of output voltage
 - ii) Power delivered to the load
 - iii) Power factor

OR

- 3. a) Explain the principle of $3-\phi$ dual converter.
 - b) A 1 ϕ full wave converter has a RL load having L = 6.5 MH, R = 0.5 Ω and
 - E = 10V. the input voltage is Vs = 120 V at (rms). 60 Hz. Determine -
 - i) The load current I_{10} at wt = $\alpha = 60^{\circ}$
 - ii) The average thyristor current I_{A}
 - iii) The RMS thyristor current I_{R}
 - iv) The RMS output current I_{RMS}
 - v) The average output current I_{dc} .

Unit - IV

- 4. a) Explain pulse width modulation control technique of power factor improvement along with circuit diagram and waveform. (8)
 - b) A 3 ϕ , M 3 converter is operated from 230V, 50Hz supply with load resistance R = 10 Ω . An average output voltage of 50% of the maximum possible output voltage is required. Determine.
 - i) Firing Angle
 - ii) Average and RMS value of load current.
 - iii) Rectification efficiency.

OR

- a) Describe the working principle of a single phase full wave semi converter with RL Load through the waveforms of supply voltage, load voltage, load current and voltage across thyristor. And also derive expressions of its. (8)
 - b) Explain in detail the extinction angle control scheme for power factor improvements. (8)

Unit - V

- 5. a) What is the principle of operation of a step up chopper.
 - b) Explain the load commutated chopper along with relevant circuit diagram and waveform. (8)

OR

- 5. a) Derive the expressions for steady state maximum and minimum current for type A chopper. (8)
 - b) Explain multiphase chopper along with relevant circuit diagram and waveform.

(8)

(8)

(8)

(8)

(8)

(8)

(2)

	Roll No.		[Total No. of Pages : 2
13	Sie ann mra mors i stài	5E5043	Perform the time respon
04	B.Tech. V Semester	r (Main /Back) Exar	nination, Nov./Dec 2017
S	Elect	trical and Electronic	s Engg.
5	5	5EX3A Control Syste	em
	(8).	Common With EF	

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

2111

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- a) Differentiate between open loop & close loop control systems with suitable example of both.
 (8)
 - b) Draw the force voltage analogy for the system.



2. Simplify the block diagram and obtain the transfer function relating C(S) & R(S).



(8)

Unit - II

3 2) Douforme 1	A CONTRACT OF A
3. a) Perform the time response analysis of	First order system with unit step input.
b) For the system 1 it is a	(8)
short and its meet	determine the time to reach peak over
short and its peak overshort when a u	nit step signal is applied at input. (8)
R(S) $E(S)$ 100	
$\overline{s(s+12)}$	- C(S)
↑B(S)	
National Contraction 200	1
OR	fille: 5 thours
4. a) Explain the concept of steady state	
b) For unity feedback system at	or and error constants. (8)
, set unity recuback system whose open	loop transfer function is
$G(S) = \frac{50}{(1 - 2)(1 - 2)}$	
(1+0.1s)(1+2s)	
Find position, velocity and acceleration	error constants.
Unit - III	(8)
5. a) Explain the importance of control syste	m components (a)
b) Explain the principle of operation of Ta	chometer (8)
OR	(8)
6. Sketch the root locus plot of unity feedback s	vstem with one in the second
$G(\mathbf{s}) = K$	ystem with open loop transfer system
$O(S) = \frac{1}{s(s+2)(s+4)}$	(10)
TI " TT-	(10)
Unit - IV	
7. Sketch the Bode plot of $G(S) = \frac{K(s+3)}{2}$	
s(s+1)(s+2).	(16)
OR OR	
8. Write technical note on :	(8×2-10)
1) Nicholas chart	(8~2=16)
ii) Gain & Phase Margin	
Unit - V	
9. Which type of compensator improves the stead	V state omen - 1/
Explain in detail.	y state error and transient response?
OR	(16)
10. Write technical note on PID controller	
	(16)

**

5E5043

	Roll No [Total No. of Pages : 2
E5044	5E5044 B.Tech. V Semester (Main/Back) Examination, Nov./Dec 2017 Electrical & Electronics Engineering 5EX4A Database Management System
S	Common With EE

18/11

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

TT	4		T
U	nit	-	1

1	2)	What is DBMS? What are the need and goals of DBMS.	(8)
1.	a) b)	Explain relational data model in detail.	(8)
		OR	
1.	a)	What is the concept of ER diagram? Differentiate between Entity Relationship sets.	sets and (8)
	b)	Explain primary, foreign and candidate key in detail.	(8)
	-)	Unit - II	
2		What do you mean by functional dependency?	(8)
۷.	a) b)	Differentiate between primitive and composite datatype.	(8)
		OR	
2	3)	What is Normalization? Explain Boyce-codd normal form and 3 NF in	detail.(8)
<i>L</i> •	a) b)	Explain the concept of physical and logical databases in detail.	(8)
		Unit - III	
3	a)	Differentiate the functionality of SQL and dynamic SQL.	(8)
з.	a) b)	What is JDBC? Explain in detail.	(8)
3.	a)	Explain the following : $(4 \times 2 = 8)$	
----	----	--	
		i) Triggers ii) DDL	
		iii) Group By iv) Database Mirroring	
	b)	How does SQL query is useful for form management and report writing? Explain in detail. (8)	
		Unit - IV	
4.	a)	What is RDBMS? Why is it called relational database? (8)	
	b)	Explain multilist structures in detail. (8)	
		OR	
4.	a)	What are indexes in SQL? Explain Non-clustered index in detail. (8)	
	b)	What are random and hashed files? (8)	
		Unit - V	
5.	a)	What is Serializability? Explain conflict and views serializability in detail. (10)	
	b)	What is data concurrency? (6)	
		OR	
5.	Wr	ite short note on (Any 2): $(2 \times 8 = 16)$	
	a)	Transaction management	
	b)	Deadlock handling	
	c)	Recovery techniques in database.	

30

	Roll No.	20	[Total No. of Pages : 2
45	oin? How are they damy	5E5045	What do the vibration
E50.	B.Tech. V Semest Electri	er (Main/Back) Examin cal And Electronics Engi	ation, Nov./Dec 2017 neering
5	5EX5A Transm	ission & Distribution of	Electrical Power
		Common with EE	
ime :	: 3 Hours	IN THE CONTRACTOR AND THE INT	Maximum Marks : 80

27/11

Min. Passing Marks Main : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- 1. a) Compare the cross-section area of a conductors for d.c. two wire system and $1-\phi$ a.c. system assuming equal length, equal power and equal losses. (8)
 - b) A 3ϕ 4 wire system is used for lighting compare the amount of conductor materials required with that needed for a 2-wire d.c. system with the same lamp voltage. Assume the same losses and balance load. The neutral is one half the cross section of one of the respective outers. (8)

OR

- a) Show that at higher voltage and higher power factor the efficiency of transmission line will be increased. What are the limiting factor of high voltage transmission line.
 (8)
 - b) Describe the main limitation of Kelvin's law. The cost of 3ϕ over head transmission line having cross sectional area A cm² is Rs [500 + 2600 A] per KW. Calculate the most economical current density for the conductor if the rate of interest and depreciation is 12% per annum. The cost of energy wasted is Rs 0.05/kwh. The resistance of each conductor is 0.17/A ohm/kM. Take load factor for loss = 12%. (8)

Unit - II

- 2. a) Derive an expression for 50g and tension in a power conductor strung between two support of equal heights taking into account the wind and ice loading also.(8)
 - b) What are the various types of line support? Discuss the suitability of each with reference to system voltage and span.
 (8)

OR

- 2. a) What do the vibration get generated in conductors? How are they damped.(8)
 - b) A transmission line has a span of 15 m between level supports. The cross sectional area of the conductor is 1.25 cm² and weighs 100 kg / 100 m. The breaking stress is 4220 kg / cm². Calculate the factor of safety if the 50 g of the line is 3.5m. Assume a maximum wind pressure of 100kg/m. (8)

Unit - III

- 3. a) Derive an expression for the capacitance per unit length of 3ϕ line completely transposed. What is the effect of earth on the capacitance of the line. (8)
 - b) Find out the flux linkage of single phase two wire line and derive an expression for inductance per unit length.
 (8)

OR

- 3. a) Show that the inductance per unit length of an overhead line due to internal flux leakage is constant and is independent of size of conductor. (8)
 - b) Derive formula to calculate the capacitance of a double circuit line. Also the conductors are of equal diameter and spaced hexagonalls. (8)

Unit - IV

- 4. a) Write and explain the expression for power loss due to corona. What factor affected the corona losses. (8)
 - b) A 15 km long 3 φ overhead line delivers 5 mw at 11 Kv at 0.8 logging power factor. Line loss is 12% of power delivered. Line inductance is 1.1 MH per km per phase. Find sending end voltage and voltage regulation.
 (8)

OR

4. a) Draw the equivalent circuit of a long transmission line. Derive from fundamentals the following relationships between sending end and receiving end voltage and currents.

$$V_{\rm s} = AV_{\rm p} + BI_{\rm p} \& I_{\rm s} = CV_{\rm p} + DI_{\rm p}$$
(8)

b) What is ferranti effect? Explain it with the help of phasor diagram. (8)

Unit - V

- a) Define string efficiency, Explain different method of improving string efficiency.
 (8)
 - b) With neat diagram explain constructional features of various types of cable.(8)

OR

- 5. a) Derive a formula for the electric stress in a single core cable. Where is maximum stress? Where is it minimum.
 (8)
 - b) A string of a 4 insulators has self capacitances equal to 4 times the pin to earth capacitance. Calculate.
 - i) The voltage distribution across various unit as a percentage of total voltage across the string.
 - ii) String efficiency. (8)

	Roll No [Total No. of Pages :
4	5E5047
20	B.Tech. V Semester (Main/Back) Examination, Nov./Dec 2017
T	Electrical and Electronics Engg.
0	5EX6.2 A Principal of Communication System
-0	Common with EE

Maximum Marks : 80 Min. Passing Marks : 26

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Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	Explain cause and effects of atmospheric and solar noise.	(8)
		What is alreading? How It is relations	

b) Define transistor signal-to-noise ratio and noise figure of a receiver. (8)

OR

- a) An amplifier operating on a frequency range from 18-20MHz, MHz has a 10kΩ input resistance. Find the rms noise voltage at the input to this amplifier if the ambient temperature is 17°C.
 - b) If each stage has a gain of 10dB and noise figure of 10dB. Determine the overall noise figure of a two stage cascaded amplifier. (8)

Unit - II

- 3. a) Derive the power relations of single tone amplitude modulated wave. (8)
 - b) Explain the square law diode modulation method for AM generation. (8)

OR

 Prove that balanced modulator produces an output consisting of standards only. With the carrier removed. (16)

(1)

[Contd....

Unit - III

5.	a) Differentiate between narrow band and wideband FM.	(8)
	b) Explain the varactor diode modulator in detail.	(8)
•	OR	
6.	Write technical note on following :	(8×2=16)
	a) Pre emphasis and de-emphasis	
	b) PLL demodulator.	A. 1. 2984 (
	Unit - IV	
7.	Explain the noise calculation for AM-systems. Also discuss the threshol envelope defector.	d effect in (16)
	OR	
8.	Discuss the super heterodyne receiver.	(16)
	Unit - V	
9.	a) Explain Nyquist rate and Nyquist interval with suitable example.	(8)
	b) What is aliasing? How it is reduced.	(8)
	OR	
10,	Write technical note on :	8×2=16)
	a) PWM	
	b) PPM	

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	Roll No [Total No. of Pages : 2
75	5E3175
1	B.Tech. V Semester (Back) Examination, Nov./Dec 2017
E	Mechanical Engineering
2	5ME1 (O) Advanced Mechanics of Solids

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- a) Define state of stress at a point. Derive expression for stress components on an arbitrary plane in terms of rectangular stress components. (Cauchy's stress formula).
 - b) A rectangular steel bar having a cross section $2 \text{ cm} \times 3 \text{ cm}$ is subjected to a tensile force of 6000 N. Determine the normal and shear stresses on a plane whose normal has the following direction cosines: (8)
 - i) $n_x = n_y = 1/, n_z = 0$
 - ii) $n_x = 0, n_y = n_z = 1/,$
 - iii) $n_x = n_v = n_z = 1/$

OR

- 1. a) What is Lame's stress ellipsoid?
 - b) Derive the differential equations of equilibrium for 3D state of stress on a body. (4)
 - c) A cylindrical boiler, 180 cm in diameter, is made of plates 1.8 cm thick, and is subjected to an internal pressure 1400 Kpa. Determine the maximum shearing stress in the plate at point P and the plane on which it acts. (8)

Unit - II

- a) Define state of strain at a point. Derive the deformation in the neighborhood of a point.
 (8)
 - b) The following displacement field is imposed on a body $u = (xyi+3x^2zj+4k)$ 10⁻². Consider a point P and a neighboring point Q where PQ has the following direction cosines (8)

(1)

5E3175 /2017

(4)

2.	a)	What are the compatibility conditions? Explain in detail
	b)	The displacement field in micro units for a body is given by $II = (x^2 + y)i + (3)$
		$(x + y) + (x^2 + 2y)k$. Determine the principal strains at $(3, 1, -2)$ and the direction
		of the minimum principal strain. (8)
		Unit - III
3.	a)	Derive and explain the generalized Hooke's law?
	b)	A cubical element is subjected to following state of stress $x = 100$ MPa
		y = -20 MPa, $z = -40$ MPa, $xy = yz = zx = 0$. Assuming the material to be
		homogeneous and isotropic, determine the principal shear strains if $= 0.25$
		and $E = 2 \times 10^5 \text{ MPa.}$ (8)
2		OR
э.	a)	Write short notes on isotropy, anisotropy and orthotropy. (8)
	0)	Derive expression for Elastic constant G in terms of Lame's coefficients for
		(8)
4	a)	What do you meen her seen 11 and 5 and 1 and 1
	u)	symmetrical bending and unsummatrical l
	b)	A hook of circular section 25 mm diameter 1 1: (8)
		central axis is 25 mm carries a load of 5kN. Calculate the maximum stress in
		the hook. (8)
		OR
4.	a)	Define shear centre and shear flow. (8)
	b)	Derive Winkler-Bach formula for bending of curved beam. (8)
-	`	Unit - V
	a)	Derive the expression for radial and circumferential stresses induced in a
		unck cylinder which is subjected to internal pressure alone. Draw also stresses
	b)	(8)
	0)	A flat steel turbine disk of 75 cm outside diagram and 15 cm inside diameter
		rim loading of 4312 KDa. The mani-
		KPa. Find the maximum shrinkaga allowers at this speed is to be 114072
		and the shaft are rotating
		(8)

OR

- Prove that thickness of a disc of uniform strength is given Where t_c is the 5. a) thickness at r = 0. (8)
 - b) A pipe made of steel has a tensile elastic limit y = 275 MPa and E = 207×10^6 kPa. If the pipe has an internal radius a = 5 cm and is subjected to an internal pressure $p = 70 \times 10^3$ KPa, determine the proper thickness for pipe wall according to the major theories of failure. Use factor of safety as 4. (8)

5E3175

4.

4.

5.

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	Roll No.	and a straight the	[Total No. of Pages :
		5E 6201	
-		• / • • • •	" NI /D 0017
70 7	B. Tech. V Semester (M Mech	ain/Back) Examin anical Engineering	ation, Nov./Dec 2017

Maximum Marks : 80 Min. Passing Marks : 26

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Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- a) What is critical thickness of insulation? Explain its importance in heat transfer.
 - b) A furnace wall is composed of 220mm of brick, 150mm of common brick, 50mm of 85% magnesia and 3mm of steel plate on the outside. If the inside surface temperature is 1500°C and outside surface temperature is 90°C, estimate the temperatures between layers and calculate the heat loss in kJ/hm². Assume, k (for fire brick) = 4kJ/mh °C, k (for common brick) = 2.8kJ/mh °C, k(for 85% magnesia) = 0.24 kJ/mh °C and k(steel) = 240 kJ/mh °C. (10)

OR

- a) A 160 mm diameter pipe carrying saturated steam is covered by a layer of lagging of thickness of 40 mm (k=0.8W/m °C).Later an extra layer of lagging 10 mm thick (k=1.2W/m² °C) is added. if the surroundings temperature remains constant and heat transfer coefficient for both the lagging material is 10W/m² °C, determine the percentage change in the rate of heat loss due to extra lagging layer.
 - b) Derive General 3-dimensional conduction equation in Rectangular Cartesian coordinate system. (8)

Unit - II

2. a) Explain the non-dimensional parameters used in the analysis of Forced Convection? (6)

b) Cylindrical pieces of size 60 mm dia and 60 mm height with density = 7800 kg/m³, specific heat = 486 J/kgK and conductivity 43 W / mK are to be heat treated. The pieces initially at 35°C are placed in a furnace at 800 °C with convection coefficient at the surface of 85 W / m²K. Determine the time required to heat the pieces to 650°C. If by mistake the pieces were taken out of the furnace after 300 seconds, determine the shortfall in the requirements.(10)

OR

- 2. a) Explain the concept of hydrodynamic boundary layer and thermal boundary layer. What is their significance in the analysis of convection heat transfer?(8)
 - b) In a process water at 30°C flows over a plate maintained at 10°C with a free stream velocity of 0.3 m/s. Determine the hydrodynamic boundary layer thickness, thermal boundary layer thickness, local and average values of friction coefficient, heat transfer coefficient and refrigeration necessary to maintain the plate temperature. Also find the values of displacement and momentum thicknesses. Consider a plate of $1 \text{ m} \times 1 \text{ m}$ size. (8)

Unit - III

- a) Water in a tank is heated by a horizontal steam pipe of 0.25 m dia, maintained at 60°C. The water is at 20°C. Calculate the value of convective heat transfer coefficient by different correlations and compare the results. (12)
 - b) What is Grashoff Number and how it is useful in natural convective heat transfer? (4)

OR

- a) Water at atmospheric pressure (saturation temperature = 100°C) is boiling on a brass surface heated from below. If the surface is at 108°C, determine the heat flux and compare the same with critical heat flux. (10)
 - b) Explain different regimes of boiling heat transfer.

Unit - IV

(6)

- 4. a) What is 'fouling factor'? How it affects the design of heat exchanger? (6)
 - b) A cross flow heat exchanger with both fluids unmixed is used to heat water flowing at a rate of 20 kg/s from 25°C to 75°C using gases available at 300°C to be cooled to 180°C. The overall heat transfer coefficient has a value of 95 W / m^2K . Determine the area required. For gas $c_p = 1005 J/kgK$. (10)

OR

4. a) Define effectiveness and N.T.U. of heat exchanger. In which cases, N.T.U. method is used in designing of heat exchangers? (8)

5E 6201

An economiser in a boiler has flow of water inside the pipes and hot gases on the outside flowing across the pipes. The flow rate of gases is 2,000 tons/hr b) and the gases are cooled from 390°C to 200°C. The specific heat of the gas is 1005 J/kg K. Water is heated (under pressure) from 100°C to 220°C. Assuming an overall heat transfer coefficient of 35 W / m^2 K, determine the area required. Assume that the air flow is mixed.

Unit - V

- Explain Lambert's law for radiation. 5. a)
 - Two large parallel planes are at 1000 K and 600 K. Determine the heat exchange per unit area. (i) if surfaces are black (ii) if the hot one has an emissivity of 0.8 b) and the cooler one 0.5 (iii) if a large plate is inserted between these two, the plate having and emissivity of 0.2.

OR

- Explain Plank distribution law of radiation. a)
 - Determine the shape factor from the base of a cylinder to the curved surface. Also find the shape factor from curved surface to base and the curved surface b) to itself.

(6)

(6)

5.

	Roll No. [Total No. of Pages : 4]	
02	5E6202	
5	B.Tech. V Semester (Main/Back) Examination, Nov./Dec 2017	
E	Mechanical Engineering	
5	5ME2A Dynamics of Machines	
D BRC	Common with AE	

18/11

Time : 3 Hours

Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.) Units of quantities used/calculated must be stated clearly.

Unit - I

- 1. a) Compare the working and role of governor and flywheel.
 - b) A spring loaded governor is shown in figure. The two balls, each of mass 6 kg, are connected across by two springs. An auxiliary spring B provides an additional force at the sleeve through a lever which pivots about a fixed centre at its left hand end. In the mean position, the radius of the governor balls is 120 mm and the speed is 600 r.p.m. The tension in each spring is then 1 kN. Find the tension in the spring B for this position. When the sleeve moves up 15 mm, the speed is to be 630 r.p.m. Find the necessary stiffness of the spring B, if the stiffness of each spring A is 10 kN/m. Neglect the moment produced by the mass of the balls. (10)



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[Contd....

(6)

OR

- Define the terms sensitiveness of governors, stability of governors and governor
- In a Porter governor, each of the four arms is 400 mm long. The upper arms b) (6)are pivoted on the axis of the sleeve, whereas the lower arms are attached to the sleeve at a distance of 45 mm from the axis of rotation. Each ball has a mass of 8 kg and the load on the sleeve is 30 kg. What will be the equilibrium speeds for the two extreme radii of 250 mm and 300 mm of rotation of the

Unit - II

2.

a)

b)

1.

a)

Describe the gyroscopic effect on aircraft with the help of neat sketches. (6)

An automobile having rear engine is travelling along a track of 100 metres mean radius. Each of the four wheels has a moment of inertia of 2.5 kg-m² and an effective diameter of 0.6 m. The rotating parts of the engine have a moment of inertia of 1.2 kg-m². The engine axis is parallel to the rear axle and the crankshaft rotates in the same sense as the road wheels. The ratio of engine speed to back axle speed is 3:1. The automobile has a mass of 3200kg and has its centre of gravity 0.5m above road level. The width of the track of the vehicle is 1.5m. Determine the limiting speed of the vehicle around the curve for all four wheels to maintain contact with the road surface. Assume that the road surface is not cambered and centre of gravity of the automobile lies centrally with respect to the four wheels.

OR

2.

Derive a formula for the magnitude of gyroscopic couple $C = I\omega\omega_p$.

Where, I = moment of inertia, ω =angular velocity of axis of spin and ω_{p} = angular velocity of precession.

b)

a)

During forward stroke of the piston of the double acting steam engine, the turning moment has the maximum value of 2000 N-m when the crank makes an angle of 80° with the inner dead centre. During the backward stroke, the maximum turning moment is 1500 N-m when the crank makes an angle of 80° with the outer dead centre. The turning moment diagram for the engine may be assumed for simplicity to be represented by two triangles. If the crank makes 100 r.p.m. and the radius of gyration of the flywheel is 1.75m, find the coefficient of fluctuation of energy and the mass of the flywheel to keep the speed within \pm 0.75%, of the mean speed. Also determine the crank angle at which the speed has its minimum and maximum values.

(10)

(10)

(10)

(6)

5E6202

Unit - III

- 3. a) State the law of gearing and compare cycloidal gear tooth profile with involute gear tooth profile. (6)
 - b) The gear ratio (T/t) of two spur gears in mesh externally is 4:1. The two gears in mesh have a module of 6mm and a pressure angle of 20 degree. The addendum on both the gears is equal to one module. The pinion rotates at 100 rpm. Determine the number of teeth on pinion for avoiding interference, the length of path of contact and the number of pairs of teeth in contact. (10)

OR

- 3. a) Derive an expression for the minimum number of teeth required on the wheel in order to avoid interference when it meshes with pinion. (8)
 - b) Two gears in mesh have a module of 8mm and a pressure angle of 20°. The larger gear has 57 teeth while the pinion has 23 teeth. If the addendum on pinion and gear wheels is equal to one module, determine the number of pairs of teeth in contact and the angle of action of the pinion and the gear wheel. (8)

Unit - IV

- a) Explain the construction and working of sliding mesh gear box with the help of a neat sketch. (6)
 - b) An epicyclic gear train for an electric motor is shown in figure. The wheel S has 15 teeth and is fixed to the motor shaft rotating at 1450 r.p.m. The planet P has 45 teeth gears with fixed annulus A and rotates on a spindle carried by an arm which is fixed to the output shaft. The planet P also gears with the sun wheel S. Find the speed of the output shaft. If the motor is transmitting 1.5 kW, calculate the torque required to fix the annulus A. (10)



5E6202

4.

[Contd....

- 4. a) Explain any three types of gear trains with neat sketches.
 - b) The speed ratio of the reverted gear train, as shown in figure, is to be 12. The module pitch of gears A and B is 3.125mm and of gears C and D is 2.5mm. Calculate the suitable numbers of teeth for the gears. No gear is to have less than 24 teeth. (10)

(6)





- 5. a) Explain the static balancing and dynamic balancing. State the necessary conditions to achieve them. (6)
 - b) A rotating shaft carries four masses A, B, C and D which are radially attached to it. The mass centres are 30mm, 38mm 40mm and 35mm respectively from the axis of rotation. The masses, A, C and D are 7.5 kg, 5kg and 4 kg respectively. The axial distances between the planes of rotation of A and B is 400mm and between B and C is 500mm. The masses A and C are at right angles to each other. Calculate the following for a complete balance. (10)
 i) the angles between the masses B and D from mass A,
 - ii) the axial distance between the planes of rotation of C and D, and
 - iii) the magnitude of mass B.

OR

- 5. a) Explain the Tractive force, Swaying couple and Hammer blow in brief. (6)
 - b) A single cylinder engine runs at 250 r.p.m. and has a stroke of 180mm. The reciprocating parts has a mass of 120kg and the revolving parts are equivalent to a mass of 70kg at a radius of 90mm. A mass is placed opposite to the crank at a radius of 150mm to balance the whole of the revolving mass and two-thirds of the reciprocating mass. Determine the magnitude of the balancing mass and the resultant residual unbalance force when the crank has turned 30° from the inner dead centre, neglect the obliquity of the connecting rod. (10)

Ro	ll No	Under stinu	[Total No. of Pages :
-		5E3177	
	B.Tech. V Sem	ester (Back) Examinati	on, Nov./Dec 2017
3		Mechanical Engineering	
	5MF3(0)) Fundamentals of Aero	lynamics

Min. Passing Marks : 26

(8)

21/11

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	What are the sources of aerodynamics forces and moments over the surfaces, Explain in details.	body (8)
	b)	Write short notes on kutta condition.	(8)

OR

- 1. a) Explain the Centre of pressure for an aerodynamic body. (8)
 - b) What is an aerofoil? Explain various terms associated with aerofoil nomenclature indicating them on an aerofoil sketch. (8)

Unit - II

- 2. a) What is the difference between a symmetric airfoil and unsymmetric airfoil?(8)
 - b) Derive the expression for work or energy transfer in terms of lift and drag for a cascade of a turbomachine. (8)

OR

2. a) Describe the important nomenclature of a turbine cascade with a neat sketch.

- b) Consider a thin flat plate at 5 Deg. Angle of attack. Calculate the : (8)
 - a) Life coefficient,
 - b) Moment coefficient about the leading edge,

c) Moment coefficient about the quarter chord point.

Unit - III

3. a) D

-) Derive the following relations for isentropic flow
 - i) $\frac{dg}{g} = \begin{pmatrix} M^2 \\ 1 M^2 \end{pmatrix} \frac{dA}{A}$.
 - ii) $\frac{dv}{v} = \begin{pmatrix} 1\\ 1-M^2 \end{pmatrix} \frac{dA}{A}$

Where all the notations have their usual meanings.

b) A suspersonic nozzle is to be designed for flow with mach number 2 at the outlet section, which has 30 cm diameter. The pressure and temperature of air at the nozzle outlet are to be 10 KPa and 250 K respectively. Determine the reservoir pressure, the temperature and the throat area. ($\gamma = 1.4$). (§.)

OR

- 3. The pressure, temperature and Mach number at the entry of a flow passage are 20 bar, 25°C and 1.4 respectively. If the exit Mach No. is 2-0, determine flow of a perfect gas ($\gamma = 1.3$, R = 0.465 KJ/KgK) (16)
 - i) Temperature and velocity of gas at exit
 - ii) The flow rate per square meter of the inlet cross section
 - iii) Stagnation temperature.

Unit - IV

- **4.** a) Explain the fanno line and Rayleigh line in detail with h-s plane.
 - b) Air flows through a short tube without friction. Heat is supplied to increase the initial Mach number of 0.9 at a temperature of 303 K to a final Mach number of 0.5. How much heat must be supplied per unit mass of air? (8)

OR

- 4. A circular duct passes 9 Kg/s of air passes at an exit Mach number of 0.6. The entry pressure and temperature are 4 bar and 40°C respectively and the coefficient of friction 0.004. If the Mach number at entry is 0.2, determine. (16)
 - a) Duct diameter.
 - b) Length of duct.
 - c) Pressure and temperature at exit, and
 - d) Stagnation pressure loss.
 - e) Verify the exit Mach number through exit velocity and temperature.

5E3177

(8)

(8)

Unit - V

5. a) Explain Prandtl Mayer relation.

b) In a normal shock wave occurring in air ($\gamma = 1.4$) the density downstream of the shock is 3 times that on the upstream. Calculate the corresponding to pressure ratio and velocity ratio. What are the Mach numbers upstream and downstream of the shock? (8)

OR

- 5. A convergent divergent nozzle is designed for a pressure ratio of $0.15 \left[\frac{P_A}{P_0} = 0.15 \right]$ (16)
 - a) Find the exhaust pressure which will locate the plane of the shock at exit section.
 - b) Find the location of the shock when the pressure ratio is 0.5 (assume that the nozzle has uniform divergence in its diverging section and ($\gamma = 1.4$).

203	Roll No [Total No. of Pages : 7
	5E6203
	B.Tech. V Semester (Main/Back) Examination, Nov./Dec 2017
F	Mechanical Engineering
5	5ME3A Measurement & Metrology
	Common With PI

Maximum Marks : 80 Min. Passing Marks : 26

21/11

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1.	a)	List the various measurement methods and explain.	(8)
	b)	Describe the different types of errors in measurements and their resp	ective
		causes.	(8)

OR

1. a) Make a comparison between accuracy and precision. (8)

b) Briefly discuss on calibration of temperature measuring devices with suitable examples. (8)

Unit - II

- a) Differentiate the "Linear measuring instruments" and "Interval measuring instruments" with suitable examples.
 (8)
 - b) Explain the working principle of mechanical comparator with neat sketch.(8)

OR

- 2. a) State and explain the "Taylor's principle" of gauge design. (8)
 - b) Explain the principle and construction of an auto-collimator with neat sketch.(8)

[Contd....

Unit - III

a) Describe the two wire method of finding the effective diameter of screw threads. Given the figure below indicating stylus height values for a surface roughness measurement, find the Ra and Rq value.



OR

- 3. a) What are the various methods used for measuring the gear tooth thickness?Explain them with neat sketches. (8)
 - b) How to check the composite errors of the gear by using Parkinson gear testing machine? Explain it in detail? (8)

Unit - IV

4. With neat sketch explain the various types of CMM based on its construction. Write the advantages of computer aided inspection. (16)

OR

- 4. a) How the angle is measured using a laser interferometer? (8)
 - b) Explain the acceptance tests for surface grinders. (8)

Unit - V

- a) State any four inferential types of flow meters. Briefly explain various methods of measuring flow.
 (8)
 - b) What is the principle involved in fluid expansion thermometer? Briefly explain various methods of measuring temperature. (8)

OR

5. Write short note on : Venturimeter, Pitot tube, Pyrometer and Rotameter. (16)

Ī	Roll No		[Total No. of Pages : 4
t		5E6204	demographic interview. (12
7	B.Tech. V Seme	ster (Main/Back) Examina	tion, Nov./Dec 2017
3		Mechanical Engineering	
	5MF4	A Quality Assurance and Re	lighility

Maximum Marks : 80 Min. Passing Marks : 26

23/11

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Explain what do you mean by quality. Describe the dimensions of quality.(2+8)

b) Define what do you mean by quality of design. Enumerate the factors influencing quality of design. (2+4)

OR

- a) A lot contains 100 items, 5 of which do not conform to requirements. If 10 items are selected at random without replacement, find the probability of finding one or less non-conforming item in the sample. (4)
 - b) An experiment was conducted in which 10 observations on road octane number were obtained for each of two product formulations. These data are indicated in Table 1 below for gasoline formulation 1 and formulation 2. Table 1 Road octane numbers for two Gasoline formulations :

Observation No.	1	2	3	4	5	6	7	8	9	10
Formulation 1 (contains lead)	89.5	90.0	91.0	91.5	92.5	91.0	89.0	89.5	91.0	92.0
Formulation 2. (Contains no lead)	89.5	91.5	91.0	89.0	91.5	92.0	92.0	90.5	90.0	91.0

Construct a 99% confidence interval on the true mean difference in road octane numbers (Given $t_{0.005, 18} = 2.878$). (12)

- Explain chance and assignable causes of variability in quality and compare a) these two. (2+3)
 - There are seven major tools for statistical process control problem solving. b) What are these called? Explain each one of these. (1+10)

OR

A tyre company sells its ATC-50 Tyres with a 50,000 miles-treaded life warranty. 2. Simulated road tests were conducted to monitor life of the output from the ATC-50 production process. For each of the last 12 batches of 1000 tyres, 5 tyres were tested and the results were recorded as following in Table 2 with (\bar{x} and R)

Table 2 \overline{x} & R values :

2.

3.

Batch No.	1	2	3	4	5	6	7	8	9	10	11	12
\overline{x}	50.5	49.7	50.0	50.7	50.7	50.6	49.8	51.1	50.2	50.4	50.6	50.7
R	1.1	1.6	1.8	0.1	0.9	2.1	0.3	0.8	2.3	13	20	21

a) Construct a \overline{x} chart

Is the production process under control? Explain. b)

Unit - III

Frozen orange juice concentrate is packed in a 6-OZ cardboard cans. These a) cans are/formed on a machine by spinning them from cardboard stock and attaching a metal bottom penal. A can could possibly leak either on the side seam or around bottom penal. 30 samples of n = 50 cans each were selected at half-an-hour interval over a three shift period in which the machine was in continuous operation. The data are shown in Table 3 below :

Table 3 Data for Trial control limits - n = 50

10	1 3)
10-	+/1

(12)

(4)

Sample number	Number of non-conforming	Sample number	Number of non-conforming	Sample number	Number of non- conforming cans
1	cans		cans		curis
1	12	11	5	21	20
2	15	12	6	22	18
3	8	13	17	23	24
4	10	14	12	24	15
5	4	15	22	25	0
6	7	16	8	25	9
7	16	17	10	20	12
8	9	18	5	21	1
9	14	10	12	28	13
10	10	20	13	29	9
Ectal 1' 1	10	20		30	6

Establish a control chart and conclude whether the production process is in control.

Consider the data in the Question No. 3 (a) above in Table - 3 for the fraction non conforming orange juice concentrate cans and determine the parameters of np control chart and construct a np control chart. (4+2)

3.

b)

Table - 3.1 indicates the number of non-conformities observed in 26 samples a) of 100 printed circuit boards (pcb). The inspection unit is defined as 100 Toble 2

number	Number of non-conformities	Sample number	Number of non-conformities	Sample number	Number of non- conformities
1	21	10	25	10	
2	24	11	20	19	28
3	16	10	20	20	39
1	10	12	24	21	30
7	12	13	16	22	24
5	15	14	10	22	24
6	5	15	1)	23	16
7	28	15	10	24	19
0	20	16	17	25	17
0	20	17	13	26	17
9	31	18	22	20	15

1aule - 3.1	Data on t	he number	ofnon	0 m C				
		ne number		COnformities	in a	amalas	C100 D	~ ~

Construct a C chart and indicate whether process is in control. A personal computer manufacturer wishes to establish a control chart for (6+2)non-conformities per unit on the final assembly line. The sample size selected as 5 computers. Data on the numbers of nonconformities in 20 samples of 5 computers each are shown in Table - 3.2.

Table - 3.2 Data on number of non-conformities in personal computers, sample

Sample number	Total number of non conformities	Sample number	Total number of
1	10	11	non-comormities
2	12	11	9
3	8	12	5
4	14	13	7
5	14	14	11
6	10	15	12
7	16	16	6
0		17	8
0	17	18	10
9	10	19	7
10	15	20	5

5E6204

[Contd....

Construct a control chart for average number of non conformities.

- 4. a) Explain what do you mean by quality assurance. Enumerate advantage of quality assurance. (1+3)
 - b) Enumerate reasons for customer (field) complaints and design a procedure for handling and disposal of customer complaints. (2+3)
 - c) A double sampling plan is as follows :
 - i) Select a sample of 2 from 20 articles. If both the articles inspected are good, accept the lot. If both are defective, reject the lot. If 1 is good and 1 is defective, take a second sample of 1 article.
 - ii) If the articles in the second sample is good, accept the lot. If it is defective, reject the lot. If a lot 25% defective is submitted what is the probability of acceptance.

OR

- 4. a) A single sampling plan uses a sample of size 15 and an acceptance numbers 1 using Hypergeometric probabilities, compute the probability of acceptance of lots of 50 articles 2% defective.
 - b) Compute the consumer's risk for the single sampling scheme from a batch of 2000 items with LTPD = 0.01, sample size 15 and acceptance number 1.(6)
 - c) Enumerate the major clauses of international standard ISO 9001 : 2008. (4)

Unit - V

5. a) An electronic circuit consists of 5 Silicon Transistors, 3 Silicon Diodes 10 composition Resistors and 2 ceremic capacitors. The hourly failure rate of each component is given as follows

Silicon Transistor = 4×10^{-5} Silicon Diode = 3×10^{-5} , composition Resistor = 2×10^{-4} , ceramic capacitor = 2×10^{-4} . Calculate the reliability of the circuit for 10 hours when the components follow exponential distribution.(6)

b) Explain what do you mean by reliability. Describe Bath Tub curve for pattern failures. (2+8)

a) Estimate the system reliability of the units arranged in the assembly of a product shown in the product below. Individual reliability is indicated in the block (Assume the elements to be independent).
 (8)



b) Describe Taguchis methodology of design of experiments.

(8)

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(8)

OR

	Roll No. [Total No. of Pages :
5	5E6207
70	B.Tech. V Semester (Main/Back) Examination Nov /Dec - 2017
E	Mechanical Engineering
n	5ME6.2A Automobile Engo

Maximum Marks : 80 Min. Passing Marks : 26

29/11

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

- a) How is a frame different from a chassis? Discuss the design aspects and salient features of frame? (2+4)
 - b) With the help of neat sketch. Explain Hydraulic and Vacuum air braking system. (5+5)

OR

- 1. a) Explain working of fluid coupling with the help of neat sketch. (6)
 - b) How the size of a clutch plate. Determined? How does the uniform pressure criteria differ from the uniform wear consideration? How does the mean effective radius influence the torque transmitting ability in both the design criteria? (2+4+4)

Unit - II

- a) Which component in the transmission system makes a difference between the two wheel drive and the four wheel drive. Discuss the working of the same with neat sketch.
 - b) Explain the construction and working of constant mesh and synchromesh gear box? (5+5)

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- 2.
- a) Write short notes on the following (any two) :
 - i) Over drive
 - ii) Universal Joint
 - iii) Propeller Shaft
 - iv) Torque Tube drive
- b) Explain Construction and working of hydraulic torque converter with the help of neat sketch.

(4+4)

(8)

(8)

Unit - III

- 3. a) What do you mean by tyre retreading? Name various tyre retarding process and explain them. How will you ascertain whether a tyre needs retreadity or not? (2+4+2)
 - b) State the Principle and derive equation for correct steering of a vehicle. Hence draw "Ackermann's Steering Mechanism" and Explain wheel lock and steering lock angles?
 (3+3+2)

OR

- 3. a) Sketch the construction of a double acting telescopic. Type Hydraulic shock absorber and explain it's working. Why it is known as "double acting" and "telescopic type"?
- b) What do you mean by power steering? Different between a conventional and a power steering system. Explain the principles of power steering and draw its construction layout.

Unit - IV

- 4. a) Describe in detail the method of battery charging. Also explain in detail how would perform specific gravity tests.
 - b) Describe the construction and working of starter motor for automobiles. (8)

OR

- **4.** a) Write short notes on the following (any two) :
 - i) Electric horn
 - ii) Fuel level indicator
 - iii) Head Lamp

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(2)

b) With help of neat sketch explain working and construction of Magneto ignition system.
 (8)

Unit - V

- 5. a) What is refrigerant? Explain different types of refrigerants? (2+6)
 - b) Describe the working of an automotive air conditioning system along with fraction of each components. (8)

OR

- 5. a) Explain the following :
 - i) Night Vision System (NVS)
 - ii) Global Positioning system
 - b) What are safety requirement in automobile. Explain the safety devices used in automobiles? (3+5)

(4+4)



Maximum Marks : 80 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1.	(16)
1.	(

OR

1. Discuss the relation between social change, evolution and progress. (16)

Unit - II

2. Explain the following :

- a) Tribal society
- b) Rural society

OR

2. Discuss the characteristics of organisation.

Unit - III

3. Distinguish between perfect competition, monopolistic competition, oligopoly and monopoly forms of market. (16)

OR

3. Explain different concepts of National Income. How do they differ from each other. (16)

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[Contd....

(8 + 8 = 16)

(16)

Unit - IV

(16)

Revealed with

4. Discuss the functions of commercial banks.

OR

4. What are the tools of fiscal policy. How does fiscal policy accelerates economic growth. (16)

Unit - V

5. Critically analyse the economic growth in post reform India. (16)

OR

5. What is unemployment? Discuss the problems and trend of employment in public and private sectors. (16)

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