Q.P. Code: 253012 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB:* Quantity Surveying *and Valuation (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. Give the detailed specifications of the following items of works. **14M**
   (i) Earthwork in excavation in foundation (ii) Random rubble stone masonry.

(OR)

2. What are the different methods of Building Estimates explain briefly? **14M**

UNIT – II

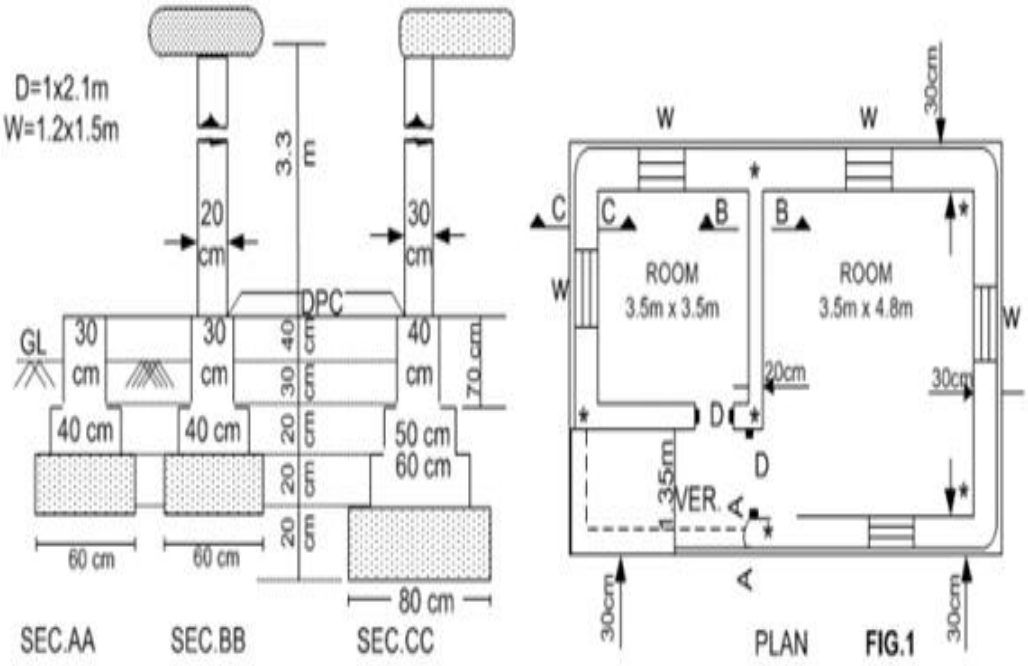
3. Describe the procedure for the calculation of rate for the following **14M**
   (i) C.C 1:5:10 in foundation with brick ballast 40mm thick unit 1cum
   (ii) R.C.C. brick work on slab etc 1:3mortar unit 1cum

(OR)

4. What do you understand by "rate analysis"? Explain the procedure of analysis rates of work items. Make analysis of rate of cement plaster 12 mm thick in 1:4 cement mortar **14M**

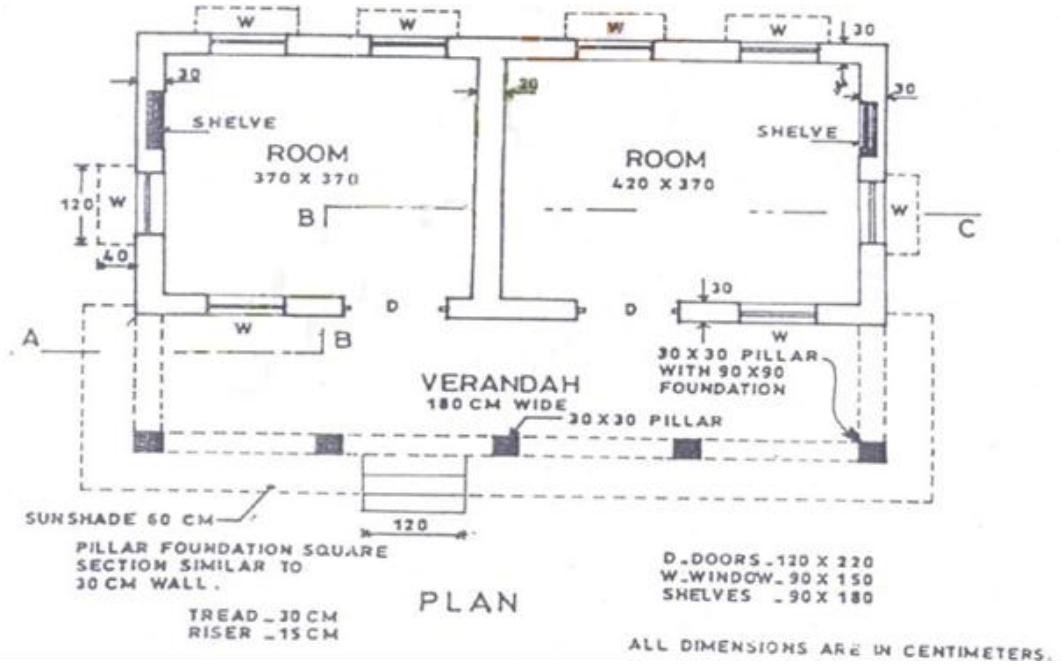
UNIT – III

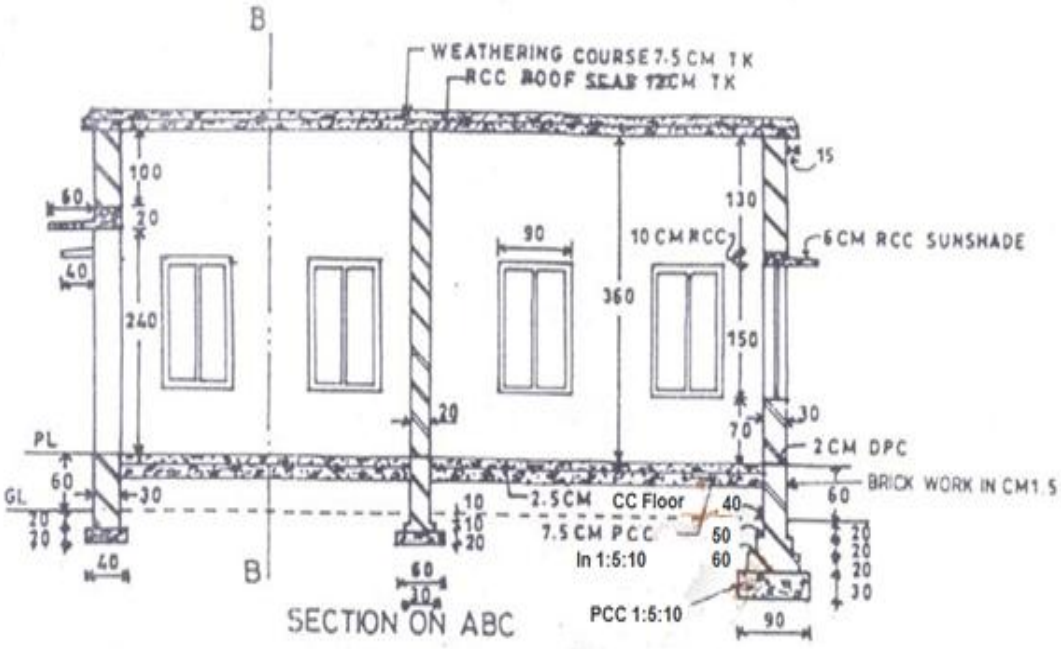
5. Explain detailed specification for the following items: (a) Flooring with cement concrete. (b) Pointing to the sub structure. (c) Colour Wash to the Walls. (d) Damp proof course **14M**



(OR)

6. Prepare detailed estimates of building by centre line method as shown in fig ? **14M**





UNIT – IV

7. With an example Prepare a detailed estimate of a RCC Slab of 3m span and 6m long including centering and shuttering and steel reinforcement? Also prepare a schedule of bars **14M**

(OR)

8. With an example Prepare a detailed estimate of a RCC Rectangular Beam including centering and shuttering and steel reinforcement? Also prepare a schedule of bars **14M**

UNIT-V

9. Explain the following method of valuation of a building along with an example. **14M**
   (i) Rental method of valuation (ii) Direct comparison with the capital value.

(OR)

10. Explain the following method of valuation of a building along with an example. **14M**
    (i) Valuation based on profit (ii) Depreciation method of valuation.

Q.P. Code: 252812 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Finite Element Methods (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Explain the advantages and disadvantages of Finite Element Method. What are the limitations in this method? 9M
   (b) Explain about Finite Difference Method. 5M

(OR)

2. (a) What are the engineering applications of Finite Element Method? 6M
   (b) What are the various considerations to be taken in the discretization process? 8M

UNIT – II

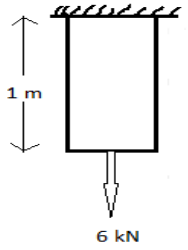
3. (a) Derive the shape function of a bar element in Global Coordinate System. 7M
   (b) Define Geometric Variance. What is meant by displacement function? 7M

(OR)

4. (a) Derive the shape functions for a one dimensional linear line element in global Co-ordinate system. 7M
   (b) Discuss about convergent and compatibility requirements 7M

UNIT – III

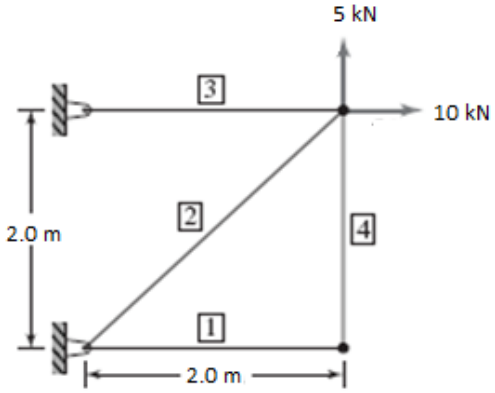
5. (a) A steel bar of length 1m is subjected to an axial load of 6 kN as shown in the figure. Estimate the nodal displacement of the bar and load vectors. 10M



   (b) Differentiate between Global and Local Coordinate systems 4M

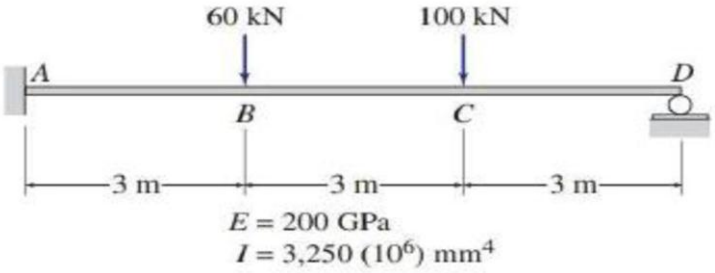
(OR)

6. The plane truss shown in the below Figure is comprised of members having a square 20 mm × 20 mm cross section and modulus of elasticity E = 70 GPa. Determine the nodal displacements and the stresses in each element. 14M



UNIT – IV

7. Determine the deflection under the loads and construct the shear force and bending moment diagrams for the beam shown below. 14M



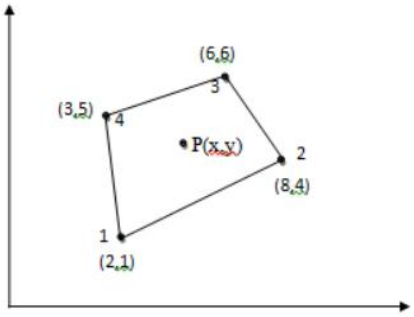
(OR)

8. (a) Derive the expression for stress – strain relationship for a 2d- element. 10M

(b) Distinguish between Plane stress and Plane strain analysis of a beam. 4M

UNIT-V

9. For the isoparametric quadrilateral element shown in the below Fig. the Cartesian co-ordinate of point P are (6,4). The loads 10KN and 12KN are acting in x and y direction on the point P. Evaluate the nodal equivalent forces. 14M



(OR)

10. On a four nodal quadrilateral plane stress element the nodes are (0, 0), (6, 2), (6, 6) and (1, 5). A concentrated load whose x and y components are 12 kN, 18 kN respectively is applied at a point (4, 5). Find the equivalent nodal forces and the displacement of nodes. 14M

Q.P. Code: 253212 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Design & Drawing of Irrigation Structures (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any ONE Question from the following

1. Design a canal drop (notch type) of 2 m with the following data

Hydraulic Particulars	Upstream Side	Downstream side
Full Supply discharge	4 cumecs	4 cumecs
Bed width	6 meters	6 meters
Bed level	+10.00	+8.00
Full supply depth (F.S.D)	1.5meters	1.5meters
Full Supply Level (F.S.L)	+11.50	+9.50
Top of bank level (T.B.L)	+12.50	+10.50

The Ground level at the site of work is + 10.50
Good soil is available for foundation at + 8.50
Draw to a suitable scale the following
(i) Longitudinal section and
(ii) Half plan at top and half plan at foundation level

(OR)

2. Design a regulator-cum- road bridge with the following data

Hydraulic Particulars	Upstream Side	Downstream side
Full Supply discharge	20 cumecs	16 cumecs
Bed width	15 meters	15meters
Bed level	+20.00	+20.00
Full supply depth (F.S.D)	2.0meters	1.75meters
Full Supply Level (F.S.L)	+22.00	+21.750
Top of bank level (T.B.L)	+23.00	+22.750

The Ground level at the site of work is + 22.00
Good soil is available for foundation at + 19.00
At Upstream, the right bank is 5 meters wide and left bank is 2m wide.
At downstream, top width of bank are the same as those on the upstream
The regulator carries a road way single lane designed for I.R..C loading class A. Provide clear free board of one meter above F.S.L for the road bridge.
Draw to a suitable scale the following
(i) Longitudinal section and
(ii) Half plan at top and half plan at foundation level

Q.P. Code: 253412 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Sanitary Engineering (CE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Differentiate between domestic sewage, industrial sewage and sanitary sewage	6M
	(b)	Discuss the rational formula for calculating peak drainage discharge from a given catchment area	8M
		(OR)	
2.	(a)	Determine the size of a circular sewer for a discharge of 800 lps running half full. Assume i=0.0001 and n=0.015	7M
	(b)	Discuss in brief various sewer appurtenances and their location and functions.	7M

UNIT – II

3.	(a)	Derive the 1^{st} stage BOD equation.	7M
	(b)	Explain the cycles of decomposition.	7M
		(OR)	
4.	(a)	Write a short note on i) screening and ii) Grit chamber	7M
	(b)	Design a circular settling tank for a treatment of sewage at 12 million liters per day. Assume suitable values of detention period and surface loading.	7M

UNIT – III

5.	(a)	Distinguish between suspended growth process and attached growth process. Name treatment method in each category	6M
	(b)	Design a conventional activated sludge treatment plant based on the following data. i) Sewage flow = 2 MLD ii) MLSS = 2500 mg/lit ii) Inlet BOD = 200 mg/lit iv) F/M ratio = 0.3	8M
		(OR)	
6.	(a)	With neat sketch, describe the principles involved in the design and construction of Oxidation pond.	7M
	(b)	Explain the design concept of secondary sedimentation tank.	7M

UNIT – IV

7.	(a)	Discuss in brief biological nitrification – de-nitrification method for removal of nitrogen from sewage.	7M
	(b)	Explain the sewage disposal on land for irrigation.	7M
		(OR)	
8.	(a)	What do you understand by sludge stabilization? Explain the sludge dewatering process.	7M
	(b)	Design a septic tank for 100 users. Water allowance is 120 lpd. Assume suitable data if required.	7M

UNIT-V

9.	(a)	Explain the various source and its types of solid waste generation.	7M
	(b)	What are the various methods of solid waste disposal? Discuss about sanitary land fill in detail	7M
		(OR)	
10.	(a)	What are various sources of air pollutions? Explain the effects of air pollutions on human beings.	7M
	(b)	Explain the permissible limits of noise pollution.	7M

Q.P. Code: 352412 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Reliability Engineering & Application to Power Systems (EEE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Explain the basic concept of probability theory. What are the rules for combining probabilities of events? Explain? 7M

   (b) A generating station consists of 6 units of 30MW each. If the probability of failure of each unit is 0.1. Calculate the probability of the system [i] Supplying at least 120MW [ii] Not able to supply 90MW 7M

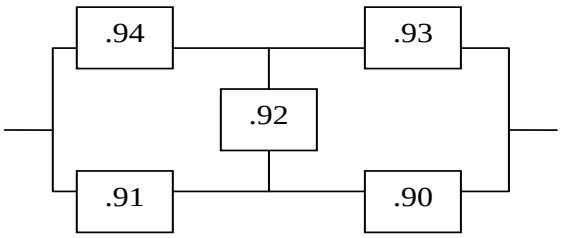
(OR)

2. (a) Explain probability density and distribution functions with examples. 7M

   (b) Derive the expressions for expected value and standard deviation of binomial distribution. 7M

UNIT – II

3. (a) 7M



A system of independently operating elements is represented by the bridge network above. The numbers are component reliabilities. Use the delta-star transformation to compute system reliability. Verify your answer using the decomposition approach.

   (b) With a neat sketch explain the various regions of Bath-Tub curve. 7M

(OR)

4. (a) Prove that the expected value and standard deviation of an exponential distribution are equal. 7M

   (b) A system consists of two components, one of which must operate for system success. If the failure rates are 0.05 f/yr and 0.02 f/yr respectively and the average repair times are 20hr and 25hr respectively, evaluate the system failure rate, average repair time and unavailability. 7M

UNIT – III

5. (a) Explain Markov analysis in detail. How reliability can be calculated from this model ? 7M

   (b) Discuss about Time dependent probability evaluation using laplace transform approach 7M

(OR)

6. (a) Discuss about the frequency of encountering the states of 2-component with non-identical departure rates. Also, Discuss the Mean Duration, Cycle Time of individual states of the system. 7M

   (b) Discuss the evaluation of cumulative probability and cumulative frequency of encountering of merged states 7M

UNIT – IV

7. (a) Explain Recursive relation for unit addition with an example 7M

   (b) Discuss briefly about the parameters required to completely determine periodic load model and give expressions for mean duration, probability, Upward load departure rate Downward load departure rate and Frequency for peak load and low loads. 7M

(OR)

8. (a) Explain Loss of Load Probability index 4M

   (b) Consider a system containing five 40 MW units each with a forced outage rate of 0.01. Determine the capacity outage probability for this system. Also find LOLE using cumulative probabilities. 10M

UNIT-V

9. (a) Explain the weighted average rate model and two-weather Markov Model of transmission lines. 7M

   (b) Define and explain various reliability indices used in bulk power system reliability analysis 7M

(OR)

10. For the power system shown in below figure evaluate load point reliability indices and other performance indices 14M

Given Data:

Generating units: 6 x 40 MW units

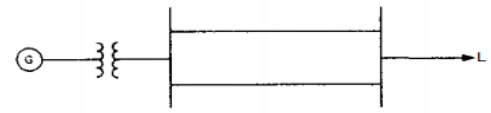
X = 0.01 f/day

μ = 0,49 r/day ,U=0.02

Transmission elements 2 lines

A = 0.5 f/yr r= 7.5 hours/repair ,L' = 0.0004279

Load : Peak load = 180MW



Q.P. Code: 353212 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Flexible AC Transmission Systems (EEE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) With a neat diagram explain the flow of power in AC system. **7M**
   (b) Write short notes on loading capability limits of transmission system. **7M**

(OR)

2. Discuss about the basic types of FACTS controllers with an example for each type. **14M**

UNIT – II

3. (a) Explain the operation of 24 pulse bridge converter using transformer connections with neat diagram. **7M**
   (b) Compare the advantages and disadvantages of voltage source converters over current source converters. **7M**

(OR)

4. (a) Explain the basic concept of voltage source converter with the help of a neat diagram. **7M**
   (b) Write short notes on pulse width modulation converters. **7M**

UNIT – III

5. (a) Explain how midpoint voltage regulation of a transmission line increases the power transfer capacity of the lines. **7M**
   (b) Explain about switching converter type VAR generators. **7M**

(OR)

6. (a) Explain how midpoint voltage regulation of a transmission line increases the transient stability margin. **7M**
   (b) Explain the methods of controllable VAR generation. **7M**

UNIT – IV

7. (a) Explain in detail principle working of SVC with neat sketch. **7M**
   (b) Briefly describe the way by which transient stability is enhanced with STATCOM. **7M**

(OR)

8. Explain the function of SVC and STATCOM in order to maintain regulation and slope transfer function. **14M**

UNIT-V

9. (a) Discuss about the concept of series capacitive compensation. **7M**
   (b) Explain the principle and operation of GTO Controlled Series Capacitors with neat diagram. **7M**

(OR)

10. (a) Explain the principle and operation of TSSC with neat diagram. **7M**
    (b) Explain basic operating control scheme of TCSC with neat diagram. **7M**

Q.P. Code: 353412 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Utilization of Electrical Power (EEE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Discuss the cosine cube law of illumination. 7M
   (b) Two sources of having luminous intensity 400 candela are hung at a height of 10 m. The distance between the two lamp posts is 20 m. Find the illumination (i) beneath the lamp and (ii) in the middle of the posts. 7M

(OR)

2. (a) Compare the performance of tungsten filament lamps and fluorescent lamps. 7M
   (b) An illumination on the working plane of 100 lux is required in a room 45×25 m in size. The lamps are required to be hung 3 m above the plane. Assuming a suitable space–height ratio, a utilization factor of 0.8, a lamp efficiency of 18 lumens/W, and a candle power depreciation of 30%, estimate the number, rating, and disposition of lamps. 7M

UNIT – II

3. (a) Discuss the various modes of heat dissipation. 7M
   (b) Explain with a neat sketch the principle of core type induction furnaces. 7M

(OR)

4. (a) Explain varies types of arc welding processes. 7M
   (b) Discuss the construction and working of direct arc furnace. 7M

UNIT – III

5. (a) Explain the factors that affect the choice of motor. 7M
   (b) Discuss the starting characteristics of separately excited dc motor. 7M

(OR)

6. (a) Discuss the applications of electrical drives. 7M
   (b) Explain the classification of loads. 7M

UNIT – IV

7. (a) Review the existing electric traction systems in India. 7M
   (b) Explain the special features of traction motors. 7M

(OR)

8. (a) What are the requirements of good electric braking? 7M
   (b) Explain the methods of plugging when induction motors are employed for electric traction. 7M

UNIT-V

9. (a) What are the factors which influence the value of coefficient of adhesion? 7M
   (b) Explain analysis of Trapezoidal Speed–Time curve. 7M

(OR)

10. (a) Derive the equations of tractive effort required to accelerate (i) the train mass horizontally and (ii) the rotating parts. 7M
    (b) Determine of Specific Energy Output from Simplified Speed–Time Curve. 7M

Q.P. Code: 452012 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Biomedical Instrumentation (ECE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What are the factors to be considered in the design of biomedical instrument?	6M
	(b)	Discuss in detail about the static & dynamic characteristics of medical instruments.	8M
		(OR)	
2.		With neat block diagram, explain the components of medical instrumentation systems.	14M

UNIT – II

3.	(a)	Illustrate the action potential curve of a cell in detail.	6M
	(b)	Explain the characteristics of resting potential with reference to Nernst equation.	8M
		(OR)	
4.	(a)	How do you record the action potential?	5M
	(b)	Elaborate the electro physiology of nerve cell and transmission of impulse from nerve to muscle.	9M

UNIT – III

5.	(a)	Distinguish between internal and external electrodes.	5M
	(b)	Describe the Electrical Conduction system of the heart.	9
		(OR)	
6.	(a)	Describe the relation between electrical and mechanical activities of the heart.	7M
	(b)	Explain the role of pacemaker as a therapeutic instrument. Elaborate the operation of ventricular inhibited pacemaker.	7M

UNIT – IV

7.	(a)	What is Einthoven Triangle? Explain how ECG lead configurations are employed.	7M
	(b)	Describe the standard 12 lead system used for recording ECG.	7M
		(OR)	
8.	(a)	Elucidate the mechanism of human respiratory system.	6M
	(b)	Explain the working of spirometer with the help of functional diagram.	8M

UNIT-V

9.	(a)	Write in detail about the role of leakage current in patient electrical safety.	7M
	(b)	Demonstrate the patient isolation in safety mechanisms.	7M
		(OR)	
10.	(a)	Elaborate on the medical equipment maintenance and safety parameters in handling it.	9M
	(b)	Suggest the remedies for hazards in operation rooms.	5M

Q.P. Code: 453012 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Radar Systems (ECE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Define RCS of a target. Explain about the RCS of simple targets.	7M
	(b)	With the help of block diagram explain the operation of pulse radar.	7M
		(OR)	
2.		A certain C-Band radar with the following parameters peak power=1.5MW, operating frequency 5.6GHz, antenna gain 45dB, effective temperature 290K, pulse width 0.2microsec. The radar threshold is 20dB. Assume target cross section 0.1m2. Calculate maximum range	14M

UNIT – II

3.		Write short notes on (a) Noise Figure (b) Modulator (c) CFA	14M
		(OR)	
4.	(a)	Discuss in detail about Balanced type duplexer using TR tubes.	7M
	(b)	Describe about radar displays and also its types of presentations.	7M

UNIT – III

5.	(a)	With the help of polar and rectangulat antenna patterns explain about lobe switching.	7M
	(b)	Explain the principle of operation of multiple frequency CW radar.	7M
		(OR)	
6.		Explain the operation of conical scan tracking radar for generating an error signal in case of elevation and azimuth direction.	14M

UNIT – IV

7.	(a)	Explain about LF/MF Four course radio Range	8M
	(b)	Explain about VOR receiving equipment.	6M
		(OR)	
8.	(a)	Write in detail about the errors in direction finding.	10M
	(b)	Write short notes on loop Antenna	4M

UNIT-V

9.		Explain in detail about i) LORAN – C ii) TACAN	14M
		(OR)	
10.		Explain about DME and write it's operation in detail.	14M

Q.P. Code: 453212 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Satellite Communications (ECE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Explain the origin of satellite communication.	7M
	(b)	Discuss the brief history of satellite communication.	7M
		(OR)	
2.	(a)	Discuss orbital effects in communication system performance.	7M
	(b)	Distinguish look angle determination and orbital determination.	7M

UNIT – II

3.	(a)	Draw the block diagram of telemetry, tracking and command subsystem and explain each block	7M
	(b)	Explain the operation of space craft subsystem.	7M
		(OR)	
4.	(a)	Discuss the antenna subsystem.	7M
	(b)	Draw the block diagram of attitude and orbit control system.	7M

UNIT – III

5.	(a)	Design satellite uplink.	7M
	(b)	Derive the G/T ratio of satellite link.	7M
		(OR)	
6.	(a)	Briefly explain basic transmission theory.	7M
	(b)	Compare uplink and downlink design issues.	7M

UNIT – IV

7.	(a)	Explain Demand Access Multiple Access.	7M
	(b)	Demonstrate TDMA super frame structure.	7M
		(OR)	
8.	(a)	Compare TDMA and FDMA.	7M
	(b)	Explain the concept of CDMA.	7M

UNIT-V

9.		Discuss the earth station design with neat diagram.	14M
		(OR)	
10.		Explain the small earth station antennas	14M

Q.P. Code: 453412 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Cellular & Mobile Communications (ECE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What are the limitations of conventional Mobile Telephone System?	4M
	(b)	With a neat sketch, explain the operation of a cellular system.	10M
		(OR)	
2.	(a)	What are the limitations of conventional Mobile Telephone System?	4M
	(b)	With a neat sketch, explain the operation of a cellular system	10M

UNIT – II

3.		Describe: (a)Foliage loss (b)long distance propagation (c) Cell-site antenna heights	14M
		(OR)	
4.	(a)	Tabulate standard conditions and correction factors at the base station and at mobile unit	7M
	(b)	Explain propagation in near-in distance.	7M

UNIT – III

5.	(a)	What is the effect of lowering antenna height in various cases?	7M
	(b)	Explain the Real - time co-channel interference measurement.	7M
		(OR)	
6.	(a)	Write short notes on Umbrella pattern antennas.	4M
	(b)	Explain the design of a directional antenna system.	10M

UNIT – IV

7.	(a)	Explain The factors included in Dropped call rate evaluation	7M
	(b)	Explain Handoff & their characteristics	7M
		(OR)	
8.	(a)	Explain how the handoffs implemented based on signal strength.	7M
	(b)	How the dropped call rate is related to the capacity and voice quality.	7M

UNIT-V

9.		Describe GSM architecture with relevant diagrams.	14M
		(OR)	
10.		Explain the principle of CDMA with a neat sketch and write its advantages and disadvantages.	14M

Q.P. Code: 552412 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Geometric Modeling (ME)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT – I

1.	(a)	Explain the basic operations of DVST display device with neat sketch.	8M
	(b)	List out input devices and write shot notes	6M
		(OR)	
2.	(a)	Write difference between Flood-fill and Boundary-fill Algorithm	7M
	(b)	Explain a scan-line polygon fill algorithm	7M

UNIT – II

3.	(a)	Describe about Cyrus –beck line clipping algorithm	7M
	(b)	Explain midpoint subdivision line algorithm	7M
		(OR)	
4.	(a)	Explain about Sutherland-Hodgman algorithm for polygonal clipping in detail	9M
	(b)	Write about 3D clipping	5M

UNIT – III

5.		What do you mean by curve representation? Explain about Bezier curve in detail.	14M
		(OR)	
6.	(a)	Briefly explain about Polygon surfaces with neat sketch.	7M
	(b)	Explain about spline surface representation.	7M

UNIT – IV

7.		What is the importance of 2D transformation matrix in geometric modeling? Explain about (i) Translation (ii) Rotation (iii) Scaling (iv) Reflection with an example?	14M
		(OR)	
8.		Explain briefly about i) Reflection ii) shear transformation iii) composite transformations in 3D transformation.	14M

UNIT-V

9.	(a)	Discuss about constant intensity algorithm with neat sketch.	7M
	(b)	Explain phong shading algorithm.	7M
		(OR)	
10.	(a)	Write short notes on i) scan-line ii) depth sorting.	8M
	(b)	Explain depth- buffer algorithm in detail.	6M

Q.P. Code: 552612 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Gas Turbines and Jet Propulsion (ME)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT – I

1. (a) With a neat sketch explain the working of open cycle gas turbine? 7M

   (b) A gas turbine receives air at 1 bar and 300 K and compress it adiabatically 6.2bar.The compressor efficiency is 88%.The fuel has a heating value of 44186 KJ/Kg K and fuel air ratio is 0.017 Kj/Kg of air. The turbine internal efficiency is 90%.Calculate the work of turbine and compressor per kg of air compressed and thermal efficiency. For products of combustion C_p=1.147 kJ/kg K and γ=1.333. 8M

(OR)

2. What are the methods to improve the efficiency of a gas turbine cycle and discuss any two methods in detail? 14M

UNIT – II

3. Derive an expression for thrust, thrust power, propulsive efficiency and thermal efficiency of the jet engines? 14M

(OR)

4. (a) Discuss the need for thermal jet engines and write its applications? 7M

   (b) Mention how the jet propulsion engines are Classified? 8M

UNIT – III

5. (a) Explain the working of a turbofan engine. 7M

   (b) Explain thrust augmentation methods in turbojet engine. 8M

(OR)

6. The following data pertain to a turbo-jet flying at an altitude 9500 m: 14M
   Speed of the turbo-jet=800km/h, Propulsive efficiency=55%
   Overall efficiency of the turbine plant=17%, Density of air at 9500m altitude=0.17kg/m^3
   Drag on the lane -6100N. Assuming calorific value of the fuels used as 46000 kJ/kg.
   Calculate:
   (i)Absolute velocity of the jet.
   (ii)Volume of air compressed per min
   (iii)Diameter of the jet
   (iv)Power output of the unit
   (v)Air-fuel ratio

UNIT – IV

7.		Explain the working principle of ram jet engine with a neat sketch? State its advantages and disadvantages?	14M
		(OR)	
8.	(a)	List out the differences between Turbojet and Pulse jet engines?	7M
	(b)	With the aid of a schematic diagram explain the working of a pulse jet engine?	8M
		UNIT-V	
9.	(a)	Write the applications of Rockets?	7M
	(b)	With the help of a neat sketch explain the working of rocket propulsion system?	8M
		(OR)	
10.	(a)	Give the classification of rockets?	7M
	(b)	List out merits of liquid propellant rockets over solid propellant rockets?	8M

Q.P. Code: 552812 **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Renewable Energy Sources (ME)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What is Solar Radiation? Write the Types of Solar Radiation	8M
	(b)	Which Instruments are used to measure the solar Radiation	6M
		(OR)	
2.	(a)	How to Find Solar Constant? Write the formula and units of Solar Constant?	8M
	(b)	Discuss Four Causes of Energy Scarcity	6M

UNIT – II

3.	(a)	What is Solar Heating and Cooling ? Also write how the solar energy used for Heating and cooling	8M
	(b)	List the applications of solar Energy?	6M
		(OR)	
4.	(a)	With neat Diagrams explain (i) Solar Cooker (ii) Solar Furnace	12M
	(b)	What is Solar Pond?	2M

UNIT – III

5.	(a)	Classify the wind Energy Conversion System	4M
	(b)	Describe the main considerations in selecting a site for wind Generators?	10M
		(OR)	
6.	(a)	With a neat sketch, Explain the working principle of Bio Gas Plant?	10M
	(b)	Discuss about the Factors or Guidelines for Wind Turbine Site selection	4M

UNIT – IV

7.	(a)	Write a Short notes on (i) Fuel Cell (ii) Wave Energy (iii) Hydrogen Energy	12M
	(b)	What is Ocean energy?	2M
		(OR)	
8.	(a)	With a neat Diagram Explain the principle if Tidal Power Generation	10M
	(b)	List the Advantages of Tidal Power Generation	4M

UNIT-V

9.	(a)	What is MHD? How it works?	6M
	(b)	Differences between open cycle and closed cycle in MHD System	8M
		(OR)	
10.	(a)	How does a Fuel cell Power plant work?	8M
	(b)	What are the four thermodynamic process	6M

Q.P. Code: 553012 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Automation & Robotics (ME)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Briefly explain different types of automation.	7M
	(b)	List and explain automation strategies.	7M
		(OR)	
2.	(a)	Explain the basic elements of an automated system with sketch	7M
	(b)	Define sensor. Explain common measuring sensors used in automation system.	7M
		UNIT – II	
3.		Explain work part transfer mechanisms with neat sketch	14M
		(OR)	
4.	(a)	What are the automated assembly system configurations? Explain.	7M
	(b)	Why storage buffers are used in automated production lines.	7M
		UNIT – III	
5.	(a)	What is an industrial robot? Explain the robot anatomy.	7M
	(b)	Explain common robot configurations with a neat diagram.	7M
		(OR)	
6.	(a)	With suitable sketches, briefly explain any two end effectors.	7M
	(b)	Explain with sketches the types of joints used in robot.	7M
		UNIT – IV	
7.		Explain manipulator kinematics of forward and backward transformation for a robot with two joints.	14M
		(OR)	
8.	(a)	Explain D-H notation with suitable diagrams.	7M
	(b)	What is trajectory planning and explain its necessity in a robot.	7M
		UNIT-V	
9.	(a)	Explain importance of actuators in robots.	7M
	(b)	Explain potentiometer and resolver application in robot.	7M
		(OR)	
10.	(a)	Explain proximity and range sensors.	7M
	(b)	Explain nonindustrial applications of robot.	7M

Q.P. Code: 652812 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Digital Image Processing (CSE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.		What is meant by Image Digitization? Explain various types of resolutions with the help of neat Diagram	14M
		(OR)	
2.		Define the Hierarchical structure with suitable examples with neat diagram	14M

UNIT – II

3.		What is Pixel brightness transformations and Explain with an example	14M
		(OR)	
4.		Explain the different types of Mean Filters with examples	14M

UNIT – III

5.	(a)	Define Smoothing and Sharpening of color image processing	10M
	(b)	What are the different color models	4M
		(OR)	
6.	(a)	What are the different logical operations in Binary images	10M
	(b)	Define Thinning	4M

UNIT – IV

7.		Explain about in detail on Edge and line Detection with suitable examples	14M
		(OR)	
8.	(a)	Define the term Thresholding.	6M
	(b)	Write a note on Edge Detector performance in Segmentation.	6M

UNIT-V

9.	(a)	What are the different applications of discrete image transforms	10M
	(b)	Define Wavelets	6M
		(OR)	
10.		Define Compression and explain various compression methods	10M

Q.P. Code: 653012 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Management Science (CSE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. Describe about the evolution of management thought. 14M

(OR)

2. (a) Briefly explain the types of organization. 7M
   (b) What do you understand by social responsibility of Management? 7M

UNIT – II

3. "Corporate Planning is not synonymous with long range planning" Why? Discuss. 14M

(OR)

4. (a) Explain the significance of strategy formulation. 7M
   (b) What is SWOT Analysis? Explain in brief. 7M

UNIT – III

5. (a) Define HRM. What are the functions of HRM? 7M
   (b) What is inventory? Explain the need for inventory control. 7M

(OR)

6. (a) Briefly explain the important types of employee incentive plans. 7M
   (b) How do you maintain store records in the organization? Explain. 7M

UNIT – IV

7. (a) Examine the process involved in conducting method study. 7M
   (b) Briefly discuss different steps in work Measurement. 7M

(OR)

8. (a) Outline the functions which are to be carried out under quality control. 7M
   (b) Explain control charts for variables and attributes 7M

UNIT-V

9. (a) What do you mean by Net Work analysis? And how network analysis help in project Management? 7M
   (b) What is project crashing? Project crashing objectives and stages involved in the project Crashing Management 7M

(OR)

10. a project schedule has the following characteristics 14M

Activity	1-2	1-3	2-4	3-4	3-5	4-9	5-6	5-7	6-8	7-8	8-10	9-10
Time (Weeks)	4	1	1	1	6	5	4	8	1	2	5	7

(i) construct the network
(ii) Compute earliest occurrence time(E) and least occurrence time(L) for each even
(iii)Find the critical path

Q.P. Code: 653212 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Ethical Hacking (CSE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT – I

1.	(a)	Explain in detail about DNS Information tools?	7M
	(b)	Explain different types of hacker attacks?	7M
		(OR)	
2.	(a)	Discuss in detail about elements of security?	7M
	(b)	Explain information gathering Methodologies?	7M

UNIT – II

3.	(a)	Explain in detail about Enumeration technologies?	7M
	(b)	Explain any four tools of enumeration?	7M
		(OR)	
4.		Discuss in detail about Scanning?	14M

UNIT – III

5.		Discuss in detail about Key loggers and Spywares?	14M
		(OR)	
6.	(a)	Explain about password cracking tools?	7M
	(b)	Explain tools on Executing applications?	7M

UNIT – IV

7.	(a)	Write any four tools on Linux OS vulnerabilities?	7M
	(b)	Write short notes on port programming?	7M
		(OR)	
8.	(a)	How to write Windows OS vulnerabilities?	7M
	(b)	Write short notes on Linux OS counter measures?	7M

UNIT-V

9.		Discuss in detail about phases of penetration testing?	14M
		(OR)	
10.		Write short notes on following tools i) AppScan ii) HackerShield iii) SAINT iv) SecureScan v) WebInspect	14M

Q.P. Code: 653412 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Software Project Management (CSE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Explain about Waterfall Model.	7M
	(b)	Describe about how software Improving automation through software environments	7M
		(OR)	
2.	(a)	Explain about conventional software Management performance.	7M
	(b)	Discuss in detail about pragmatic software cost estimation	7M

UNIT – II

3.	(a)	What is meant by Elaboration phase? Discuss the primary objectives and essential activities of Elaboration phase?.	7M
	(b)	Explain the pragmatic software metrics?	7M
		(OR)	
4.		Explain about model-based architecture in a management perspective.	14 M

UNIT – III

5.	(a)	Describe about Work breakdown structures?	7M
	(b)	Describe about Major milestones?	7M
		(OR)	
6.	(a)	What are major milestone that occur at the transition points between life cycle phases? Explain them?	7M
	(b)	Explain about iteration planning process?.	7M

UNIT – IV

7.	(a)	Explain Project Control and process instrumentation in detail?	7M
	(b)	Explain about evolution of organizations?	7M
		(OR)	
8.	(a)	Describe about Pragmatic software metrics?	7M
	(b)	Explain in detail about metrics automation?	7M

UNIT-V

9.	(a)	Discuss about CCPDS-R Case Study?	7M
	(b)	Describe about Future Software Project Management Practices?	7M
		(OR)	
10.	(a)	Write short notes on the Modern process transitions?	7M
	(b)	Explain in details about Modern Project Profiles?	7M

Q.P. Code: 353012 | **SET - 2**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VIII Sem. (R15) Advanced Supple. Examinations of September – 2021

SUB: Electrical Machine Design (EEE)

Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Derive the expression for magnetizing current of 1- ϕ transformer. 7M

   (b) Find the no load current of a 250/100 V, 2 kVA, 50 Hz single-phase transformer with the following data. Cross-sectional area of core = 25 cm^2, effective magnetic core length = 0.45 m, weight of core = 8 kg, maximum flux density = 1.5 T, magnetizing mmf = 250 AT/m and specific core loss = 1.9 W/kg. 7M

(OR)

2. (a) Explain the constructional features of the transformer. 7M

   (b) A 300 kVA, 6600/440 volt, three-phase delta/star core type transformer has a maximum flux density of 1.35 Wb/m^2 and the total weight of core is 650 kg. The magnetizing VA/kg and the iron loss/kg corresponding to 1.35 Wb/m^2 are 30 and 2.5 watt, respectively. Calculate the no load current if the m.m.f. required for joints is 2.5 per cent of that iron. Assume other data needed. 7M

UNIT – II

3. (a) Briefly explain the methods to reduce the armature reaction in D.C. machines. 6M

   (b) Compute the diameter and the length of armature core of a 12 kW, 220 V, 4-pole, 1200 r.p.m. shunt generator. The specific electric loading is 18,000, average flux density is 0.46 Wb/m^2, full load efficiency is 0.86 and long pole construction is adopted. The length to pole pitch ratio is 0.92. Friction and windage losses are neglected. 8M

(OR)

4. (a) Describe the procedure for the design of field system of DC machine. 7M

   (b) Estimate specific electric loading and specific magnetic loading of a 200 kW, 410 V, 480 r.p.m.,4-pole generator having a diameter of 0.80 m and length of 0.20 m. It has wave winding with 450 conductors. Voltage drop in armature is assumed to be negligible. 7M

UNIT – III

5. (a) What are the various considerations in the selection of specific electric and magnetic loading for the design of a 3-phase induction motor? Explain. 6M

   (b) Determine the main dimensions, turns per phase, number of slots, conductor section and slot area of a 3-phase, 5 H.P., 400 volts, 50 Hz, 1500 r.p.m. (synchronous), squirrel cage induction motor. The machine is to be started by a star-delta starter. The efficiency is 0.8 and power factor is 0.8 lagging at full load. 8M

(OR)

6. (a) When the performance was calculated at the design stage of a poly-phase induction motor, it was found to give a poor power factor. Discuss the modification which can probably be made to the design for improving its performance. 6M

(b) Determine the approximate diameter and length of the stator core, the number of stator slots for a 15 kW, 440 V, 3-phase, 4-pole, 1425 r.p.m induction motor with data given below: Specific magnetic loading = 0.48 Tesla 8M

Specific electric loading =25,000 ampere-conductor per meter

Full load efficiency = 88 per cent

Full load power factor = 0.88.

UNIT – IV

7. (a) Describe the factors influencing the length of air gap of 3 phase synchronous machine. 6M

(b) Calculate the main dimensions of a 1000 kVA, 2200 V, 3 phase, 8 pole, 50 Hz, star-connected alternator. The winding has a 60° phase spread and the coils are full pitched. The specific magnetic and electric loading may be taken as 0.62 Wb/m^2 and 30,000 ampere conductors/m. Use circular poles whose ratio of pole arc to pole pitch is 0.65. 8M

(OR)

8. (a) Describe the procedure for the determination of main dimensions of synchronous machine. 7M

(b) Determine the main dimensions, flux, conductors/slot, number of turns per phase and size of armature conductors of an 80 MVA, 11 kV, 50 Hz, 3000 rpm, 3-ϕ, star-connected alternator whose average gap density is 0.6 Tesla, ampere conductors per metre is 50,000 and peripheral speed is 180 m/s. Assume winding factor as 0.95 and current density as 6 A/mm^2. 7M

UNIT-V

9. (a) Differentiate between direct and indirect cooling with examples? 7M

(b) Discuss how the temperature rise affects the selection of machine rating? 7M

(OR)

10. (a) Explain the various methods of cooling of transformer. 7M

(b) Find the amount of cooling air required per second at the inlet temperature of 25°C for a 2500 kVA alternator working at full load, the efficiency is 96% and the power-factor is 0.87. The temperature of air coming out of machine is 50°C. Assume suitable values for specific heat and density of air. Air pressure is760 mm of mercury. 7M