AR13

Time: 3 Hours   Max Marks: 70

PART-A

Answer any Three questions Part-A   **[3 X 14 = 42 M]**

1. a) What do you understand by Floor Space Index (FSI) and Floor Area Ratio (FAR)   [7M]
        and explain?
    b) What is the importance of lighting and ventilation in bye buildings and also in   [7M]
        general constructions? Explain?
2   What are the characteristics of educational institutions and Explain?   [14M]
3. a) Write the importance and necessity in planning of buildings for recreation.   [7M]
    b)   Write the importance and necessity in planning of hospitals?   [7M]
4.   Explain CPM and PERT network plan?   [14M]
5. a) Write the importance and necessity in planning of dispensaries.   [7M]
    b) What is the importance of open space requirements according to building bye-laws?   [7M]
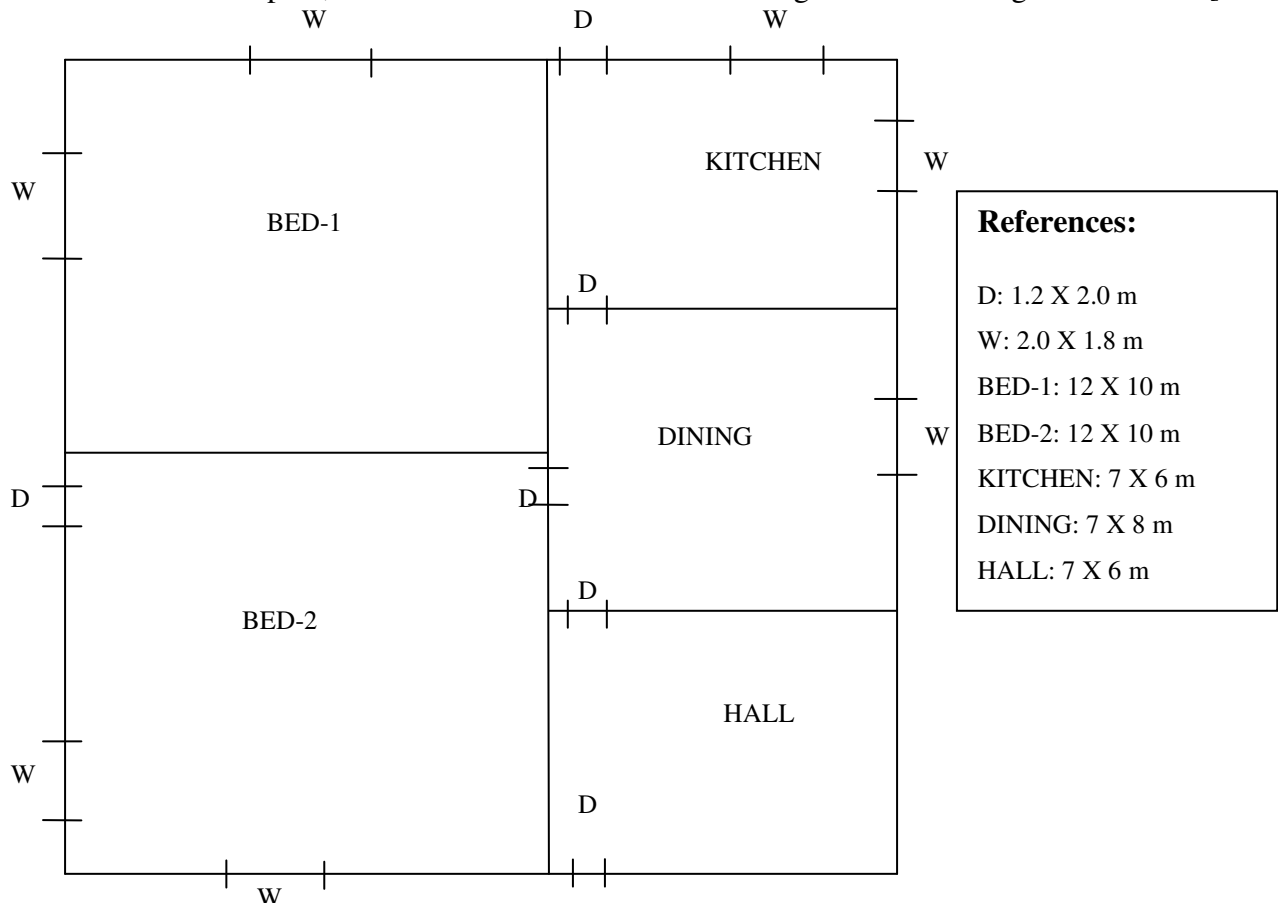
PART-B

Answer any **one** question from Part-B   **[1x28=28M]**

UNIT-I

6. (a) Draw the sketch of one and a half brick wall for an Flemish bond.   [8M]
    (b) Draw the plan and elevation of the line diagram shown in figure 1?   [20M]
7.   Draw the plan, section and elevation of the line diagram shown in figure 1?   [28M]

References:

D: 1.2 X 2.0 m
W: 2.0 X 1.8 m
BED-1: 12 X 10 m
BED-2: 12 X 10 m
KITCHEN: 7 X 6 m
DINING: 7 X 8 m
HALL: 7 X 6 m

Fig: 1

CODE: 13EE3014
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2018
POWER SYSTEMS – II
(Electrical and Electronics Engineering)

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

PART-A

ANSWER ALL QUESTIONS   **[1 X 10 = 10 M]**

1. a)   What is the effect of ground on line capacitance?
    b)   What is meant by transposition of power conductors?
    c)   What are the units of A B C D constants of a transmission line?
    d)   Define regulation and efficiency for a transmission line.
    e)   Why the surge impedance is less in underground cables compared to overhead lines?
    f)   What are the types of power system transients?
    g)   Why skin effect is absent in DC systems?
    h)   What do you mean by natural loading of a line?
    i)   Mention any two advantages of suspension insulators over pin type insulators.
    j)   What are the disadvantages of allowing too high sag?

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. (a)   Deduce an expression for the capacitance per phase of a 3-phase double circuit line with hexagonal spacing.
    (b)   A 220 KV, 50 Hz, 200 Km long 3-ϕ line has its conductors on the corners of a triangle with sides 6m, 6m and 12m. The conductor radius is 1. 81cm. Find the charging current and total charging MVAR.

(OR)

3. (a)   Prove that over the length of one transposition cycle of a 3-ϕ balanced power line, the voltage induced in a nearby telephone line is zero.
    (b)   The 3 conductors of a 3-ϕ line are arranged in a horizontal plane and are 5m apart. The diameter of each conductor is 2 cm. Find the inductance of the line per Km per phase if the line is completely transposed.

UNIT-II

4. (a)   Derive the generalized network constants of a medium transmission line and draw the phasor diagram assuming nominal-T configuration.
    (b)   What is the maximum length in km for a single phase transmission line having copper conductors of 0.775 cm^2 cross section over which 200 kw at unity pf and 3300 V are to be delivered? The efficiency of transmission is 90% and specific resistance is 1.725$\mu\Omega$-cm.

(OR)

5   (a)   Derive the expression for regulation and sending end power factor for a short transmission line from the phasor diagram.
    (b)   A 3-ϕ, 50 Hz transmission line of 80 Km long, delivers 24 MVA at 66 kV and at 0.8 pf lagging. The line conductors have a diameter of 1.5 cm and are symmetrically spaced at a distance of 2.5 m. The line resistance is 8.72 ohm/phase. Determine using nominal-π method (i) % regulation (ii) % efficiency.

UNIT-III

6 (a) What is surge impedance loading and explain the ways to enhance its value for a given transmission line?

   (b) A 3-ϕ, 50 Hz, 132 kV transmission line of 160 km long has the following distributed parameters:

   R = 0.157 Ω/km, L= 1.265 mH/km, C= 8.75×10^{-9} F/km,

   Find the sending end voltage& current when delivering 50MVA at 0.8 pf lag.

(OR)

7 (a) Derive the A B C D constants of a long transmission line.

   (b) A 3 phase 50Hz transmission line has the following constants per km

   R = 0.15 ohm, L = 1.5 mH and C = 0.02 μF.

   The voltage at the receiving end is 220 kV. If the line is open at the receiving end, find the incident and reflected voltages to neutral at 50 km from the receiving end.

UNIT-IV

8 (a) Prove that the velocity of propagation of the travelling waves over a loss less overhead transmission line is equal to the velocity of light.

   (b) An overhead line with surge impedance of 400 ohm bifurcates into two lines of surge impedance 500 ohm and 60 ohm respectively. If a surge of 33 kV is incident on the overhead line, determine the magnitudes of voltage and current which enter the bifurcated lines.

(OR)

9 (a) Explain the phenomenon of corona and the factors affecting corona loss.

   (b) A 3-ϕ, 220KV, 50Hz transmission line consists of 1.5 cm radius conductor spaced 2m apart in equilateral triangular formation. If the temperature is 40^0C and an atmospheric pressure is 76 cm of Hg, calculate the corona loss per km of the line. Take m_0 = 0.85.

UNIT-V

10 (a) Obtain an expression for the sag and the length of the line when the line is suspended between two supports at equal levels.

    (b) A transmission line has a span of 275m between level supports. The conductor has a diameter of 19.53mm, weighs 0.844 kg/m and has an ultimate breaking strength of 7950 kg. Each conductor has a radial covering of ice 9.53 mm thick and is subjected to a horizontal wind pressure of 40 kg/m^2 of the ice covered projected area. If the factor of safety is 2, calculate the vertical sag. One cubic metre of ice weighs 913.5 kg.

(OR)

11 (a) Explain why the voltage doesn't divide equally across the units of a string insulator. Discuss various methods by which the voltage across the units can be equalized.

    (b) A 3-ϕ overhead transmission line is being supported by three disc insulators. The potentials across top and middle units are 8 kV and 12 kV respectively. Calculate (i) The ratio of mutual capacitance to shunt capacitance. (ii) Line voltage (iii) String efficiency.

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AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2018

DYNAMICS OF MACHINERY
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

PART-A
ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) What is dynamic force analysis?
   b) Define fluctuation of energy?
   c) Enumerate governors?
   d) What do you mean by gyroscopic stabilization?
   e) What are the merits and demerits of friction?
   f) What are the applications of clutch?
   g) Draw simple block brake.
   h) Explain absorption type dynamometer?
   i) How do you balance several masses rotating in the same plane?
   j) How the vibrations developed?

PART-B

Answer one question from each unit   [5x12=60M]
UNIT-I

2. **a** What is the function of the flywheel? How does it differ from that of a governor?   **4M**

   b An engine flywheel has a mass of 6.5 tones and the radius of gyration is 2m. If the maximum and minimum speeds are 120 rpm and 118 rpm respectively. Find maximum fluctuation of energy?   **8M**

(OR)

3. **a** Derive an expression for the angular acceleration of the connecting rod of a reciprocating engine?   **4M**

b   The length of the connecting rod of a gas engine is 500mm   **8M**
and its centre gravity lies at 165mm from the crank pin
centre. The rod as a mass of 80kg and a radius of gyration of
182mm about an axis through the centre of the mass. The
stroke of piston is 225mm and the crank speed is 300rpm.
Determine the inertia force on the crank shaft when the crank
has turned 30^0 from the inner dead centre.

UNIT-II

4. **a**   What is the function of a governor?   **2M**

     b   In a porter governor, the upper and lower arms are each   **10M**
250mm long and are pivoted on the axis of rotation. The
mass of each rotating ball is 3kg and the mass of the sleeve is
20kg. The sleeve is in its lowest position when the arms are
inclined at 30^0 to the governor axis. The lift of the sleeve is
36mm. Find the force of friction at the sleeve, if the speed at
the moment is falls from the highest position. Also find the
range of speed of the governor.

(OR)

5. **a**   What do you mean by spin, precession and gyroscopic   **2M**
planes?

     b   A rear engine automobile is travelling along a curved track of   **10M**
120 m radius. Each of the four wheels has a moment of
inertia of 2.2 kg-m^2 and an effective diameter of 600 mm.
The rotating parts of the engine have a moment of inertia of
1.25 kg-m^2. The gear ratio of the engine to the back wheel is
3.2. The engine axis is parallel to the rear axle and the crank
shaft rotates in the same sense as the road wheels. The mass
of the vehicle is 2050 kg and the centre of mass is 520 mm
above the road level. The width of the track is 1.6 m. What
will be the limiting speed of the vehicle if all the four wheels
maintain contact with the road surface?

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UNIT-III

6. a What is friction? Is it a blessing or curse? Justify your answer and give examples?   **4M**

    b A Conical pivot bearing 150mm in diameter has a cone angle of 120^0. If the shaft supports an axial load of 20 KN and the coefficient of friction in   0.03, find the power lost in friction when the shaft rotates at 200 rpm.   **8M**

(OR)

7. **a** How do you classify clutches? Explain any one clutch with neat sketch   **6M**

    b Explain working principle of rope brake dynamometer: **6M**

UNIT-IV

8. a Explain the method of balancing of two masses revolving in the same plane?   **2M**

    b A shaft carries four masses A, B, C and D of magnitude 200 kg, 300 kg, 400 kg and 200 kg respectively and revolving at radii 80 mm, 70 mm, 60 mm and 80 mm in planes measured from A at 300 mm, 400 mm and 700 mm. The angles between the cranks measured anticlockwise are A to B 45°, B to C 70° and C to D 120°. The balancing masses are to be placed in planes X and Y. The distance between the planes A and X is 100 mm, between X and Y is 400 mm and between Y and D is 200 mm. If the balancing masses revolve at a radius of 100 mm, find their magnitudes and angular positions.   **10M**

(OR)

9. **a** What do you mean by primary and secondary balance in reciprocating engines?   **2M**

b An inside cylinder locomotive has its cylinder centre lines 0.7 **10M** m apart and has a stroke of 0.6 m. The rotating masses per cylinder are equivalent to 150 kg at the crank pin, and the reciprocating masses per cylinder to 180 kg. The wheel centre lines are 1.5 m apart. The cranks are at right angles. The whole of the rotating and 2/3 of the reciprocating masses are to be balanced by masses placed at a radius of 0.6 m. Find the magnitude and direction of the balancing masses. Find the fluctuation in rail pressure under one wheel, variation of tractive effort and the magnitude of swaying couple at a crank speed of 300 r.p.m.

UNIT-V

10. a What do you mean by whirling of shafts?   **2M**
    b A shaft 50 mm diameter and 3 metres long is simply **10M** supported at the ends and carries three loads of 1000 N, 1500 N and 750 N at 1 m, 2 m and 2.5 m from the left support. The Young's modulus for shaft material is 200 GN/m^2. Find the frequency of transverse vibration.

(OR)

11. **a** Define the terms: Vibration Isolation and transmissibility   **2M**
    b A shaft 1.5 m long, supported inflexible bearings at the ends **10M** carries two wheels each of 50 kg mass. One wheel is situated at the centre of the shaft and the other at a distance of 375 mm from the centre towards left. The shaft is hollow of external diameter 75 mm and internal diameter 40 mm. The density of the shaft material is 7700 kg/m^3 and its modulus of elasticity is 200 GN/m^2. Find the lowest whirling speed of the shaft, taking into account the mass of the shaft.

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CODE: 13EC3012   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2018
LINEAR IC APPLICATIONS
(Electronics and Communication Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) List out the advantages of negative feedback over positive feedback in operational amplifiers
    b) Draw the pin diagram of 741 op-amp.
    c) Produce the advantages of R-2R ladder DAC over weighted resistors DAC
    d) List out operational amplifier parameters
    e) Explain the difference between bias current and offset current
    f) Pulse width in monostable multi vibrator equal to
    g) Mention the application of sample and hold circuit
    h) Define barkhausen criteria for sustained oscillations
    i) Why monotonicity is needed for converters?
    j) For a differential amplifier, the input voltages are, V_1=120µv; V_2 = 80µv; Calculate Differential mode and common mode gain

PART-B

Answer one question from each unit   [5x12=60M]

UNIT-I

2. a) Derive an expression for Icq and Vcq with DC analysis of differential amplifier and derive an expression for differential gain of differential amplifier using h-parameters or r-parameters   **6M**
    b) Calculate the operating points of the differential amplifier with R_C = 3.9 Kohms, R_E=3.3 Kohms, V_{CC} = 9V and $-V_{EE}$ = -9V?   **6M**

(OR)

3. a) Discuss the concept of active load to improve the CMRR?   **6M**
    b) Determine the operating point values for the differential amplifier with Rc=4.7k ohms, RE=3.3k ohms, hfe & Rin = 100 ohms, Vcc=12V, and -VEE=-12V.   **6M**

UNIT-II

4. a) Derive the expression for gain of an op-amp to be used as Inverting Amplifier and Non-Inverting amplifier with negative feedback   **6M**
    b) For 741 op-amp, the following parameters are given. I_{CQ} = 10µa; C_c =33pf. The input voltage Vpp = 12V. Calculate the slew rate and maximum possible frequency of input voltage that can be applied to get undistorted output.   **6M**

(OR)

5. a) Discuss about ideal and practical Op-amp specifications   **7M**
    b) Provide op-amp block diagram and explain the operation of each block in detail   **5M**

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UNIT-III

6.	a)	Prove that the gain of non-inverting amplifier is more than inverting amplifier. What configuration is preferred as voltage amplifier and why?	6M
	b)	Summarize the limitations of op-amp as comparator and recall the applications of Schmitt trigger over the conventional comparators	6M

(OR)

7.	a)	Construct logarithmic amplifier using 741 and explain its operation.	8M
	b)	Why practical integrator is needed over ideal integrator? Justify	4M

UNIT-IV

8.	a)	Design a band pass filter for f_L=100Hz and fh=1KHz.Also calculate the quality factor?	6M
	b)	Design a second order high pass Butterworth filter having a cutoff frequency of 5KHz.	6M

(OR)

9.	a)	Design a bipolar 8 bit D/A convertor with a monolithic MC1408 IC. The value current for 1LSB is 8µa. Determine the output voltage for all ones and zeroes inputs.	6M
	b)	List the specifications of ADC and give the operation of dual scope ADC?	6M

UNIT-V

10.	a)	Draw the functional diagram of 555 timer and explain its operation.	6M
	b)	List out the features of 555 timer and derive the expression for frequency in Astable configuration?	6M

(OR)

11.	a)	Mention the important aspects regarding the PLL and derive the expression for lock range and capture range	6M
	b)	Explain the construction of VCO with 555 timer and explain its operation	6M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, January-2018
INDUSTRIAL MANAGEMENT SCIENCE
(Common to CSE & IT)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 X 10 = 10 M]

1. a) Difference between Management and Organization.
   b) What are the Leadership Styles?
   c) What are the types of Public Enterprises?
   d) Explain Account Rate of Return.
   e) Define Elasticity of Demand.
   f) What are the factors governing Demand Forecasting?
   g) What is MRTS?
   h) Distinguish between Fixed and Variable Costs.
   i) Classify the types of Competition.
   j) What is Monopoly?

PART-B

Answer one question from each unit   [5x12=60M]

UNIT-I

2. Explain the Herzberg's Two Factor Theory of Motivation.   [12M]

(OR)

3. (a) Explain in detail the Systems Approach to Management.   [6M]

   (b) Discuss how social responsibilities of management are important in   [6M]
   an organization.

UNIT-II

4. Explain in-detail the procedure involved in the estimation of   [12M]
   Fixed and Working Capital requirements.

(OR)

5   A firm is evaluating two projects for investments and whose each   [12M]
     cash flows are as follows

	Expected Cash Flows in INR	
YEAR	P-1	P-2
0	(9000)	(9000)
1	4500	1100
2	3100	2250
3	2500	1900

Compute Payback Period and NPV for both projects and
the discount factor of NPV is 10 %.

UNIT-III

6 (a) What are the Demand Determinants? Also explain the Law of   [6M]
        Demand and its exceptions.
   (b) Discuss the significance of Demand Forecasting with suitable   [6M]
        examples.

(OR)

7 (a) Discuss the following   [12M]
            i) Expert Opinion Method   ii) Test Marketing

UNIT-IV

8 (a) Explain the following   [6M]
            i) Production Function   ii) Laws of Returns
   (b) Explain in-detail the managerial significance of BEA. Also discuss [6M]
        its merits and demerits.

(OR)

9 (a) Distinguish between the Iso-costs and Iso-quants. Highlight their   [6M]
        specific feature with suitable examples
   (b) What is BEA? Explain procedure involved in the determination of   [6M]
        BEA.

UNIT-V

10   What is Competition? Explain the various features of Competition   [12M]
     with suitable examples.

(OR)

11   Explain the concept on different Pricing Strategies. How Pricing   [12M]
     Strategies play a vital role in the development of market demand.