AR20

CODE: 20CET313 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Regular Examinations, May,2023

FOUNDATION ENGINEERING

(CIVIL ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.		Explain standard penetration test and corrections applied to it.	10M	1	2
		(OR)			
2.	a.	Summarize the soil investigation report and its importance in Civil Engineering.	5M	1	2
	b.	The internal diameter of the sampler is 40 mm and the external diameter is 42 mm. Do you recommend the sampler for obtaining undisturbed soil samples? Why?	5M	1	2
		UNIT-II			
3.		Discuss various types of failure of slopes and explain the necessary conditions for each of them to occur.	10M	2	2
		(OR)			
4.	a)	A granular soil has saturated unit weight = 19 kN/m^3 and ø = 35 °. A slope has to be made of this material. If a factor of safety of 1.3 is needed against slope failure , determine safe angle of slope (i) when the slope is dry or submerged without seepage , (ii) if seepage occurs at and parallel to the surface of slope.	5M	2	3
	b)	Explain the friction circle method for determining the factor of safety.	5M	2	2
		UNIT-III			
5.		A retaining wall, 4m high, supports a backfill (c= 20kN/m^2; φ=30°; γ=20kN/m^3) with horizontal top, flush with the top of the wall. The backfill carries a surcharge of 20kN/m^2. If the wall is pushed towards the backfill, compute the total passive pressure on the wall, and its point of application.	10M	3	3
		(OR)			
6.	a)	Give a critical comparison of the Coulomb and Rankine earth pressure theories.	5M	3	2
	b)	An 8m high retaining wall supports a 5.5m deep sand (□=18.5kN/m^3, φ'=34°) overlying a saturated clayey sand (□$_{sat}$=20.3kN/m^3, φ'=28°, c'=17kPa). The groundwater table is located at the interface of two layers. Sketch the lateral stress distribution for an active condition.	5M	3	3

UNIT-IV

7.	a)	What are the assumptions made in the derivation of Terzaghi's bearing capacity theory?	5M	4	2
	b)	Derive the equation for the ultimate bearing capacity of soil.	5M	4	2
		(OR)			
8.		Determine the allowable gross load and net allowable load for a square footing of 2.50 m side and with a depth of foundation of 1.50 m. Use Terzaghi's theory and assume local shear failure. Take the factor of safety 2.5. The soil at the site has γ = 18 kN/m^3, c = 18kN/m^2 and $\Phi = 28°$.	10M	4	2

Φ	N_c	N_q	N_γ
25°	25.1	12.7	9.7
30°	37.2	22.5	19.7

UNIT-V

9.	a)	A group of 16 piles of 50 cm diameter is arranged with a centre to centre spacing of 1 m. The piles are 9 m long and are embedded in soft clay with cohesion 30 kN/m^2 . Bearing resistance may be neglected for the piles. Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group.	5M	5	3
	b)	Explain settlement of pile groups for cohesionless and clayey soils.	5M	5	2
		(OR)			
10.		Explain briefly about the classification of piles.	10M	5	2

UNIT-VI

11.	a)	What are the forces acting on the well foundation? Explain.	5M	6	2
	b)	Illustrate the advantages of well foundation.	5M	6	2
		(OR)			
12.	a)	Explain different shapes of well foundations with neat sketches.	5M	6	2
	b)	Explain with a neat sketch the different components of a well foundation and their functions.	5M	6	2

AR20

CODE: 20ECT313 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Regular Examinations, May, 2023

MICROPROCESSORS AND MICROCONTROLLERS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	(a)	Illustrate the effect on various signals at different T states during memory read cycle with the help of timing diagram in minimum mode of operation of 8086 microprocessor.	6	1	Understand
	(b)	Illustrate the significance of following signals used in minimum mode of operation of 8086 microprocessor: (i) ALE (ii) DEN' (iii) DT/R' (iv) Mn/Mx'	4	1	Understand
		(OR)			
2.		Represent the architecture of 8086 and explain in detail.	10	1	Understand
		UNIT-II			
3.	(a)	Develop an ALP to arrange a series of 6 hexadecimal bytes in ascending order.	6	2	Apply
	(b)	Write the differences between procedure and macro.	4	2	Understand
		(OR)			
4.	(a)	Explain the instructions with an example: POP, DIV, RCL, and LOOP	4	2	Understand
	(b)	Develop an assembly language program to find average the number of an array.	6	2	Apply
		UNIT-III			
5.		Explain the functioning of 8259 programmable interrupt controller with neat diagram.	10	3	Understand
		(OR)			
6.		State the significance of DMA controller and illustrate the architecture of DMA controller with diagram.	10	3	Understand
		UNIT-IV			
7.	(a)	Explain the register organization of 80386.	5	4	Understand
	b)	Compare 80486 and Pentium processors.	5	4	Understand
		(OR)			
8.	(a)	Explain the concept of segmentation of 80386.	5	4	Understand
	b)	Explain the signal description of 80386.	5	4	Understand
		UNIT-V			
9.		Represent the structure of Current Program Status Register (CPSR) and explain the fields.	10	5	Understand
		(OR)			
10.	(a)	Summarize the important features of ARM processor.	5	5	Understand
	b)	Illustrate the register organization of ARM processor.	5	5	understand
		UNIT-VI			
11.		Explain the addressing mod of 8051 with examples.	10	6	understand
		(OR)			
12.	(a)	Represent the structure of TCON register of 8051 microcontroller and explain the significance of each bit.	5	6	understand
	b)	Develop a program for 8051 microcontroller to toggle a LED connected at P1.3 pin.	5	6	Apply

AR20

CODE: 20EET313 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Regular Examinations, May, 2023

SWITCHGEAR AND PROTECTION

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
	UNIT-I			
1.	What are the ratings and specifications of a circuit breaker?	10	CO1	understand
	(OR)			
2.	Explain the concept of resistance switching by deriving necessary expressions?	10	CO1	Remember
	UNIT-II			
3.	Explain about the operation of static relay?	10	CO2	understand
	(OR)			
4.	Discuss why R-X loci of impedance relay is a circle having center as origin?	10	CO2	Analyse
	UNIT-III			
5.	A 3-phase transformer having line-voltage ratio of 0.4kV/11kV is connected in star delta and protective transformers on low voltage side have a ratio of 500/5. What is the ratio of current transformers on the high voltage side? Also draw the protection circuit?	10	CO3	Analyse
	(OR)			
6.	A 10MVA, 6.6kV, three phase star connected alternator is protected by merz-price protection scheme. If the ratio of the current transformer is 1000/5, the minimum operating current of the relay is 0.75A and neutral point earthing resistance is 8 ohms. Find the percentage of each stator windings which is un protected against earth faults when the machine is operating at normal voltage, the minimum resistance to provide protection for 85% of stator winding?	10	CO3	Analyse
	UNIT-IV			
7.	Draw and explain the circuit for the protection of parallel feeders?	10	CO4	Remember
	(OR)			
8.	Discuss the operation of differential protection of bus bars with diagram?	10	CO4	understand
	UNIT-V			
9.	Explain about zinc oxide lighting arrester.	10	CO5	Remember
	(OR)			
10.	Explain in detail about the insulation coordination?	10	CO5	understand
	UNIT-VI			
11.	Discuss the advantages and disadvantages of over head ground wires?	10	CO6	understand
	(OR)			
12.	Explain about methods of neutral grounding.	10	CO6	Remember

AR20

CODE: 20HST303 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Regular Examinations, May, 2023

Managerial Economics and Management Science

(COMMON TO CSE & IT)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
	UNIT-I			
1.	What is the price elasticity of demand? Explain types of price elasticity of demand.	10	1	L2
	(OR)			
2.	What is demand forecasting? Explain the different methods in demand forecasting.	10	1	L2
	UNIT-II			
3.	Define the cost? Explain short-run and long-run cost curves.	10	2	L2
	(OR)			
4.	What is the Isoquant curve? Explain the properties of the Isoquant curve.	10	2	L2
	UNIT-III			
5.	What are the features of perfect competition?	10	3	L2
	(OR)			
6.	What are the distinctions between monopoly and monopolistic competition?	10	3	L2
	UNIT-IV			
7.	What is the importance of the Henri Fayol 14 principles of Management?	10	4	L2
	(OR)			
8.	Explain the assumptions of Douglas McGregor ‘s Theories X and Y.	10	4	L2
	UNIT-V			
9.	What is the product lifecycle? Explain the different stages in the product lifecycle.	10	5	L2
	(OR)			
10.	What is digital marketing? Explain the different types of digital marketing.	10	5	L2
	UNIT-VI			
11.	Define all the following terms a. Recruitment b. Performance Appraisal c. Grievance Handling d. Welfare Administration d. Job Evaluation	10	6	L1
	(OR)			
12.	What is the difference between personal management and human resource management?	10	6	L2

AR20

CODE: 20MET312 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Regular Examinations, May,2023

DYNAMIC SYSTEMS & MECHANICAL VIBRATIONS

(MECHANICAL ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

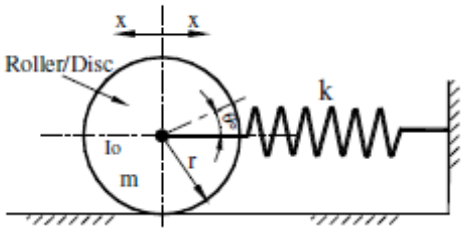
		Marks	CO	Blooms Level
	UNIT-I			
1.	Construct the profile of a cam to suit the following specifications: Cam shaft diameter = 40 mm; Least radius of cam = 25 mm; Diameter of roller = 25 mm; Angle of lift = 120°; Angle of fall = 150°; Lift of the follower = 40 mm; Numbers of pauses are two of equal interval between motions. During the lift, the motion is S.H.M. During the fall the motion is uniform acceleration and deceleration. The speed of the cam shaft is uniform. The line of stroke of the follower is off-set 12.5 mm from the centre of the cam	10M	CO1	L3
	(OR)			
2.	A cam is to give the following motion to a knife-edged follower: 1. Outstroke during 60° of cam rotation; 2. Dwell for the next 30° of cam rotation; 3. Return stroke during next 60° of cam rotation, and 4. Dwell for the remaining 210° of cam rotation. The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when the axis of the follower is passing through the axis of the cam shaft.	10M	CO1	L3
	UNIT-II			
3.	A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.	10M	CO2	L5
	(OR)			
4.	A shaft carries four masses in parallel planes A, B, C and D in this order along its length. The masses at B and C are 18 kg and 12.5 kg respectively, and each has an eccentricity of 60 mm. The masses at A and D have an eccentricity of 80 mm. The angle between the masses at B and C is 100° and that between the masses at B and A is 190°, both being measured in the same direction. The axial distance between the planes A and B is 100 mm and that between B and C is 200 mm. If the shaft is in complete dynamic balance, determine: i. The magnitude of the masses at A and D; ii. The distance between planes A and D; and The angular position of the mass at D.	10M	CO2	L5

UNIT-III

5.		The measurements on a mechanical vibrating system show that it has a mass of 8 kg and that the springs can be combined to give an equivalent spring of stiffness 5.4 N/mm. If the vibrating system have a dashpot attached which exerts a force of 40 N when the mass has a velocity of 1 m/s, find : (i) critical damping coefficient, (ii) damping factor, (iii) Logarithmic decrement, and (iv) ratio of two consecutive amplitudes.	10M	CO3	L5

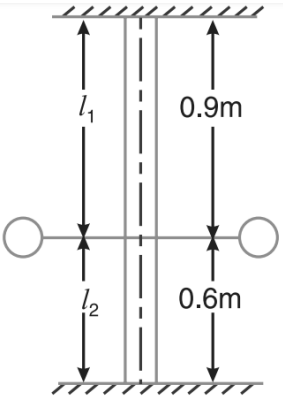
(OR)

6.	a)	Discuss briefly with neat sketches the longitudinal, transverse and torsional free vibrations.	5M	CO3	L6
	b)	Determine the natural frequency of the system shown in figure	5M	CO3	L5



UNIT-IV

7.		A flywheel is mounted on a vertical shaft as shown in Fig. The both ends of the shaft are fixed and its diameter is 50 mm. The flywheel has a mass of 500 kg. Find the natural frequencies of longitudinal and transverse vibrations. Take E=200 GN/m^2 .	10M	CO4	L1

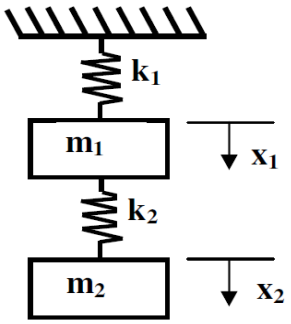


(OR)

8.	a)	A shaft 50 mm diameter and 3 metres long is simply 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.	5M	CO4	L1
	b)	Explain the term 'whirling speed' or 'critical speed' of a shaft. Prove that the whirling speed for a rotating shaft is the same as the frequency of natural transverse vibration	5M	CO4	L2

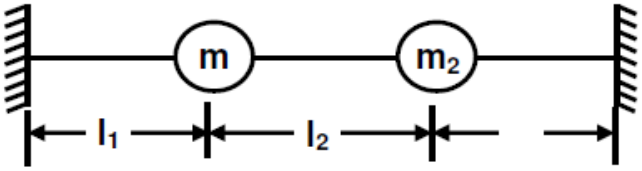
UNIT-V

9.	Obtain the frequency equation for the system shown in Fig. Also determine the natural frequencies and mode shapes when $k_1 = 2k$, $k_2 = k$, $m_1 = m$ and $m_2 = 2m$.	10M	CO5	L5



(OR)

10.	Derive the equation of motion of the system shown in fig. Assume that the initial tension 'T' in the string is too large and remains constants for small amplitudes. Determine the natural frequencies, the ratio of amplitudes and locate the nodes for each mode of vibrations when $m_2 = m$ and $l_1 = l_2 = l_3 = l$.	10M	CO5	L5



UNIT-VI

11.	A steel shaft 1.5 m long is 95 mm in diameter for the first 0.6 m of its length, 60 mm in diameter for the next 0.5 m of the length and 50 mm in diameter for the remaining0.4 m of its length. The shaft carries two flywheels at two ends, the first having a mass of 900 kg and 0.85 m radius of gyration located at the 95 mm diameter end and the second having a mass of 700 kg and 0.55 m radius of gyration located at the other end. Determine the location of the node and the natural frequency of free torsional vibration of the system. The modulus of rigidity of shaft material may be taken as 80 GN/m^2.	10M	CO6	L5

(OR)

12.	A machine has a mass of 100 kg and unbalanced reciprocating parts of mass 2 kg which move through a vertical stroke of 80 mm with simple harmonic motion. The machine is mounted on four springs, symmetrically arranged with respect to centre of mass, in such a way that the machine has one degree of freedom and can undergo vertical displacements only. Neglecting damping, calculate the combined stiffness of the spring in order that the force transmitted to the foundation is 1 / 25 th of the applied force, when the speed of rotation of machine crank shaft is 1000 r.p.m. When the machine is actually supported on the springs, it is found that the damping reduces the amplitude of successive free vibrations by 25%. Find : (i) the force transmitted to foundation at 1000 r.p.m., (ii) the force transmitted to the foundation at resonance, and (iii) the amplitude of the forced vibration of the machine at resonance.	10M	CO6	

AR16

CODE: 16ME3019 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, May, 2023
MECHANICAL VIBRATIONS
(MECHANICAL ENGINEERING)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Draw the displacement, velocity and acceleration diagrams for a follower when it moves with simple harmonic motion — 4 M

   b) A cam rotating clockwise at a uniform speed of 200 r.p.m. is required to move an offset roller follower with a uniform and equal acceleration and retardation on both the outward and return strokes. The angle of ascent, the angle of dwell (between ascent and descent) and the angle of descent is 120°, 60° and 90° respectively. The follower dwells for the rest of cam rotation. The least radius of the cam is 50 mm, the lift of the follower is 25 mm and the diameter of the roller is 10 mm. The line of stroke of the follower is offset by 20 mm from the axis of the cam. Draw the profile of the cam. — 10 M

(OR)

2. a) Define (i) Pressure angle (ii) Base Circle — 4 M

   b) Draw the profile of a cam operating a knife edged follower from the following data. The least radius of the cam is 5 cm. The axis of the follower passes through the axis of the cam shaft. — 10 M

   a)It lifts the follower through 4 cm during its 120^0 rotation with Simple Harmonic Motion.
   b) The follower remains at rest for next 70^0rotation of the cam.
   c)The follower then descents to its original position during 100^0 rotation of the cam with Simple Harmonic Motion.
   d) The follower remains at rest for the rest of the revolution.

UNIT-II

3. a) Explain clearly the terms static balancing and dynamic balancing. State the necessary conditions to achieve them. — 4 M

   b) A disc mounted on a shaft carries three mass of 4 kg, 3kg and 2.5 kg at radial distances of 75mm, 85mm and 50mm and at the angular positions of 45^0, 135^0, 240^0 respectively determine the amount of counter mass at a radial distance of 75mm required for the static balance. — 10 M

(OR)

4. A six-cylinder, single acting, and two stroke Diesel engine is arranged with cranks at 60° for the firing sequence 1-4-5-2-3-6. The cylinders, numbered 1 to 6 in succession are pitched 1.5 m apart, except cylinders 3 and 4 which are 1.8 m apart. The reciprocating and revolving masses per line are 2.2 tones and 1.6 tones respectively. The crank length is 375 mm, the connecting rod length is 1.6 m, and the speed is 120 r.p.m. Determine the maximum and minimum values of the primary couple due to the reciprocating and revolving parts. Also find the maximum secondary couple and angular position relative to crank No. 1. Take the plane between the cylinders 3 and 4 as the reference plane — 14 M

UNIT-III

5. a) Explain the terms under damping, critical damping and over damping — 6M

   b) A coil of spring stiffness 4 N/mm supports vertically a mass of 20 kg at the free end. The motion is resisted by the oil dashpot. It is found that the amplitude at the — 8 M

beginning of the fourth cycle is 0.8 times the amplitude of the previous vibration. Determine the damping force per unit velocity. Also find the ratio of the frequency of damped and undamped vibrations

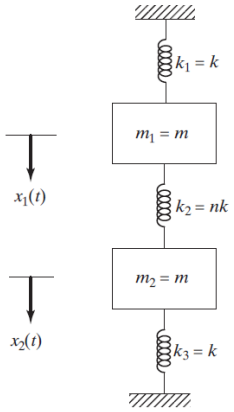
(OR)

6. a) Derive the equation to determine the frequency of transverse vibrations of a beam loaded with multiple point loads and distributed loads. 6 M

   b) A vertical shaft 25 mm diameter and 0.75 m long is mounted in long bearings and carries a pulley of mass 10 kg midway between the bearings. The centre of pulley is 0.5 mm from the axis of the shaft. Find (a) the whirling speed, and (b) the bending stress in the shaft, when it is rotating at 1700 r.p.m. Neglect the mass of the shaft and E = 200 GN/m^2 . 8M

UNIT-IV

7. Find the natural frequencies and mode shapes of a spring-mass system, shown in Fig., which is constrained to move in the vertical direction only. Take n=1 14 M



(OR)

8. a) What is the importance of vibration isolation and transmissibility 4 M

   b) The mass of an electric motor is 120 kg and it runs at 1500 r.p.m. The armature mass is 35 kg and its C.G. lies 0.5 mm from the axis of rotation. The motor is mounted on five springs of negligible damping so that the force transmitted is one-eleventh of the impressed force. Assume that the mass of the motor is equally distributed among the five springs. Determine a. stiffness of each spring; b. dynamic force transmitted to the base at the operating speed 10 M

UNIT-V

9. Two rotors A and B are attached to the end of a shaft 50cm long. Weight of the rotor A is 300N and its radius of gyration is 30 cm and corresponding values of B are 500N and 45 cm respectively. The shaft is 7cm in diameter for the first 25cm, 12cm diameter for the next 10cm and 10cm diameter for the remaining length. Modulus of rigidity for the shaft material is 8 X 10^{11} N/m^2 . Find equivalent length and diameter of the shaft. also find the natural frequencies and mode shapes of the torsional vibration. 14 M

(OR)

10. Explain the procedure using example to determine the natural frequencies of multi degree of freedom system using matrix iteration approach with the help of influence coefficients 14 M

AR18

CODE: 18CET316 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, May, 2023

Geotechnical Engineering-II

(CIVIL ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain in detail about standard penetration test with neat sketch.	6M
	b)	Distinguish disturbed and undisturbed samples. How would you obtain undisturbed samples.	6M

(OR)

2.	a)	Discuss the limitations of geophysical investigations also explain anyone method in detail.	6M
	b)	Explain in detail about Plate load test with neat sketch.	6M

UNIT-II

3.	a)	What are the assumptions that are generally made in the analysis of stability of slopes? Discuss briefly their validity.	6M
	b)	An embankment is inclined at an angle of 35° and its height is 15 m. The angle of shearing resistance is 15° and the cohesion intercept is 200 kN/m^2. The unit weight of soil is 18.0 kN/m^3. If Taylor's stability number is 0.06, find the factor of safety with respect to cohesion.	6M

(OR)

4.	a)	Distinguish finite and infinite slopes. Write different types of slope failures.	6M
	b)	An embankment 10 m high is inclined at an angle of 36° to the horizontal. A stability analysis by the method of slices gives the following forces per running meter: Σ Shearing forces = 450 kN Σ Normal forces = 900 kN Σ Neutral forces = 216 kN The length of the failure arc is 27 m. Laboratory tests on the soil indicate the effective values c′ and φ′ as 20 kN/m^2 and 18° respectively. Determine the factor of safety of the slope with respect to (a) shearing strength and (b) cohesion	6M

UNIT-III

5.	a)	What are assumptions in Rankine's pressure. Derive the expression for passive pressure.	6M
	b)	Excavation was being carried out for a foundation is plastic clay with a unit weight of 22.5 kN/m^3. Failure occurred when a depth of 8.10 m was reached. What is the value of cohesion if φ = 0° ?	6M

(OR)

6.	a)	What are assumptions in Coulomb's earth pressure theory? Compare Rankine's theory with Coulomb's theory.	6M
	b)	A retaining wall, 7.5 m high, retains a cohsionless backfill. The top 3 m of the fill has a unit weight of 18 kN/m^3 and φ = 30° and the rest has unit weight of 24 kN/m^3 and φ = 20°. Determine the pressure distribution on the wall	6M

UNIT-IV

7. a) How would you fix the depth of foundation? Discuss Rankine's for minimum depth. 6M

   b) A circular footing is resting on a stiff saturated clay with q_u = 250 kN/m^2. The depth of foundation is 2 m. Determine the diameter of the footing if the column load is 600 kN. Assume a factor of safety as 2.5. The bulk unit weight of soil is 20 kN/m^3. 6M

(OR)

8. a) List and explain different types of settlements that can occur in a foundation. 6M

   b) State assumptions of Terzaghi's bearing capacity theory also derive an expression for bearing capacity 6M

UNIT-V

9. a) Describe various types of pile foundations. 6M

   b) A square group of 9 piles was driven into soft clay extending to a large depth.The diameter and length of the piles were 30 cm and 9 m respectively. If the unconfined compression strength of the clay is 90 kN/m^2, and the pile spacing is 90 cm centre to centre,what is the capacity of the group? Assume a factor of safety of 2.5 and adhesion factor of 0.75. 6M

(OR)

10. a) How would you estimate pile group capacity in sand. 6M

    b) Determine the group efficiency of a rectangular group of piles with 4 rows, 3 piles per row, the uniform pile spacing being 3 times the pile diameter. If the individual pile capacity is 100 kN, what is the group capacity according to this concept ? 6M

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AR18

CODE: 18ECT315 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Regular (RA) / Supplementary Examinations, May, 2023

MICROPROCESSORS AND MICROCONTROLLERS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Discuss in detail about interrupt vector table in 8086 microprocessor.	6M
	b)	Explain about pipelining concept in 8086.	6M
		(OR)	
2.		Explain about addressing modes of 8086 microprocessor with relevant examples.	12M

UNIT-II

3.	a)	Discuss about Branching instructions of 8086.	6M
	b)	Develop an assembly language program to find whether a given number is prime or not.	6M
		(OR)	
4.	a)	Discuss about Assembler Directives of 8086.	6M
	b)	Develop an assembly language program to find whether a given number is Even or Odd. Assume necessary information.	6M

UNIT-III

5.	a)	Explain the internal bock diagram of 8259 interrupt controller.	6M
	b)	With neat diagram,explain about control word format of 8255 interface.	6M
		(OR)	
6.	a)	Discuss interfacing of 8257 DMA controller.	6M
	b)	Discuss about functional block diagram of 8251 USART in detail.	6M

UNIT-IV

7.		Describe the architecture of 80386 microprocessor and explain concept of segmentation and paging in 80386.	12M
		(OR)	
8.	a)	Compare 80486 and Pentium processors in various aspects.	6M
	b)	Explain the architecture of ARM processor with neat diagram	6M

UNIT-V

9.	a)	Explain various types of jump instructions according to range. And also explain the bit level logical instructions of 8051	6M
	b)	Write an 8051 ALP to generate a Fibonacci sequence. The length of the sequence should be stored at location 20H.store the sequence starting from location 30h.	6M
		(OR)	
10.	a)	Explain the instructions used to access external RAM and external program memory.	6M
	b)	Explain about memory organisation in 8051 microcontroller.	6M

AR18

CODE: 18EET314 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, May, 2023

SWITCHGEAR AND PROTECTION

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain with suitable sketches, the working of oil circuit breaker	6M
	b)	Define recovery voltage and restriking voltage.	6M
		(OR)	
2.	a)	Discuss about current chopping in the Circuit Breakers.	6M
	b)	With the help of neat diagram, explain the operation of Air Blast Circuit Breaker.	6M

UNIT-II

3.	a)	With the help of neat diagram explain the principle of static differential relay.	6M
	b)	Draw the block diagram for static time- over current relay and explain how IDMT characteristic is obtained.	6M
		(OR)	
4.	a)	What are the different types of distance relay? Compare their merits and demerits and give their field of applications	6M
	b)	Describe the operating principle, constructional features of directional relay	6M

UNIT-III

5.	a)	Explain about protection of generators against stator faults.	6M
	b)	A 11 kV 100 MVA alternator is grounded through a resistance of 4Ω. The C.T.s have a ratio of 500/5. The relay is set to operate when there is an out of balance current of 2 A. What percentage of generator winding will be protected by the percentage differential protection scheme?	6M
		(OR)	
6.	a)	Explain about protection of transformers.	6M
	b)	A 3-phase, 66/11 kV star delta connected transformer is protected by Merz-price system. The CTs on low voltage side have a ratio of 420/5 A. Find the ratio of CTs on the high voltage side	6M

UNIT-IV

7.	a)	Explain the protection of feeders by using three zone protection	6M
	b)	Explain about the Carrier current protection.	6M
		(OR)	
8.		With neat sketch discuss the differential scheme for bus zone protection	12M

UNIT-V

9.	a)	Explain with neat sketch the operation of valve type lighting arrester.	6M
	b)	Distinguish between grounded neutral and ungrounded neutral systems.	6M
		(OR)	
10.	a)	Explain the different methods of Neutral Grounding.	6M
	b)	What are the effects of Ungrounded Neutral in a power system ?	6M

AR18

CODE: 18MET315 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Regular (RA) / Supplementary Examinations, May, 2023

DYNAMIC SYSTEMS & MECHANICAL VIBRATIONS

(MECHANICAL ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. A cam is required to give motion to a follower fitted with a roller 30mm in diameter. The lift of the follower is 35mm and is performed with uniform acceleration and retardation for cam rotation 120° The follower falls through immediately with simple harmonic motion while the cam turns 120°. Then a period of dwell is followed for remaining rotation of the cam. The least radius of the cam is 25mm. The line of motion of the follower passes through the center of the cam axis. Construct the cam profile. 12M

(OR)

2. Draw the cam profile using the following data in which Knife-edge follower is raised and lowered with SHM. 12M
Least radius of cam = 60 mm.
Lift of follower = 45 mm
Angle of ascent = 60^0
Angle of dwell between ascent and descent = 40^0
Angle of descent = 75^0 remaining angle is dwell.

UNIT-II

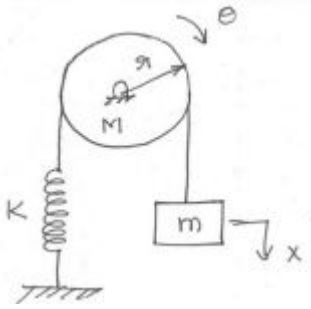
3. A disc mounted on a shaft carries three mass of 4 kg, 3kg and 2.5 kg at radial distances of 75mm, 85mm and 50mm and at the angular positions of 45^0, 135^0, 240^0 respectively measured from X – axis. Determine the amount of counter mass at a radial distance of 75mm required for the static balance. 12M

(OR)

4. A vertical engine with mass of reciprocating parts 2.75 Kg and stroke 14.25 cm has a connecting rod of length 31.5 cm. The mass centre of the connecting rod is 9.75 cm from the centre of the big end centre. When the connecting rod is suspended from the gudgeon pin axis, the rod makes 21 oscillations in 20 seconds. Determine the radius of gyration of the rod about an axis through its mass centre and the correction couple required, when the crank is at 40^0 from top dead centre and rotating at 1500 rpm. 12M

UNIT-III

5. Find the natural frequency of the spring mass-pulley system shown in figure. 12M

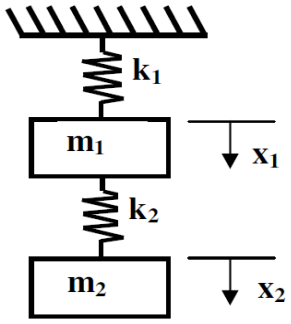


(OR)

6. a) Classify the vibrations 6M
   b) A vibrating system consists of a mass of 8 kg, spring stiffness 5.6 N/mm and a dash pot of damping coefficient of 0.04 N/mm/sec. Find (i) damping factor, (ii) logarithmic decrement and (iii) ratio of the two consecutive amplitudes 6M

UNIT-IV

7. Derive the natural frequencies of free vibrations of two degree of freedom system $k_1=k_2=k$, $m_1= m_2= m$ 12M



(OR)

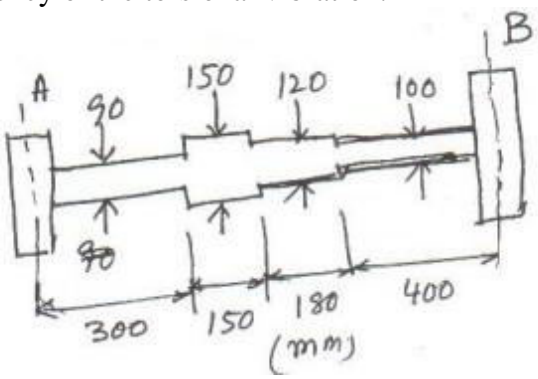
8. A shaft 50 mm diameter and 3 metres long is simply supported at the ends and carries three loads of 1000 N, 1500 N and 750 N at 1 m, 2 m and 2.5 m from the left support. The Young's modulus for shaft material is 200 GN/m^2. Find the frequency of transverse vibration 12M

UNIT-V

9. Derive the natural frequency of single rotor torsional system 12M

(OR)

10. The shaft shown in figure carries two masses A and B. The mass A is 300kg with a radius of gyration 0.9m and the mass b is 400kg with a radius of gyration 1.2m. Determine the frequency of the torsional vibration. 12M



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AR18

CODE: 18CST315 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Regular (RA) / Supplementary Examinations, May, 2023

UNIX Internals

(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Discuss various modes used by vi editor.	[6M]
	b)	Explain Unix commands mv, grep & rmdir with syntax.	[6M]
		(OR)	
2.	a)	What is an Operating System? Explain the main functions of UNIX Operating System.	[6M]
	b)	Write a short notice on file handling utilities in detailed.	[6M]

UNIT-II

3.	a)	How many ways we can use if conditional statement for decision making, in shell scripting?	[6M]
	b)	Write shell script program to check whether the given number is prime or not.	[6M]
		(OR)	
4.	a)	Explain about the different types of variables available in Unix.	[6M]
	b)	Write a shell script to print "Good Morning", "Good Afternoon" and "Good Evening" based on user login time.	[6M]

UNIT-III

5.	a)	Discuss in detail file descriptors with examples.	[6M]
	b)	Differentiate fseek () & lseek () and fgets () and gets () system calls with syntax.	[6M]
		(OR)	
6.	a)	Write about directory handling system calls.	[6M]
	b)	Write a C program which uses the following standard I/O system calls fopen, fclose, fseek, fget.	[6M]

UNIT-IV

7.	a)	Write a short note on reliable and unreliable signals.	[6M]
	b)	Distinguish fork () and vfork () system calls.	[6M]
		(OR)	
8.	a)	Explain alarm, abort and sleep functions with examples.	[6M]
	b)	Discuss the role of signals with suitable examples.	[6M]

UNIT-V

9.		What is shared memory? |What are the system calls involved in shade memory explain with suitable example.	[12M]
		(OR)	
10.		How can we create a new process in UNIX? What are various characteristics inherited by a child process from a parent process? Give an example.	[12M]

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