INSTITUTE OF SCIENCE & TECHNOLOGY

ASSIGNMENT QUESTIONS
ALL - 2ND SEM-THEORY
PAPER NAME: MATHEMATICS II
PAPER CODE: BS102/MATH-II

1. F ind the rank of a matrix $\begin{bmatrix} 1 & 0 & 1 & 0 \\ 2 & 1 & 1 & 1 \\ 1 & 1 & 0 & 1 \end{bmatrix}$.

2. Find the inverse of the matrix $\begin{bmatrix} 1 & 2 & 1 \\ 1 & -1 & 1 \\ 1 & 3 & -1 \end{bmatrix}$

3. Find by Newton Raphson method the real root of $3x^3+5x-40=0$.

4. Evalute $\int \tan^{-1}(secx + tanx)dx$.

5. solve $x^2y-x^3dy/dx=y^4\cos x$ where y=1 when x=$\pi/2$.

6. solve:$(D^2+1)y=xe^{2x}$.

PAPER NAME: APPLIED PHYSICS-II
PAPER CODE: BS-104

1. What is simple harmonic motion? Describe the qualitative nature of simple harmonic motion.
2. Discuss the terms in simple harmonic motion:
   a. Displacement (b) Velocity (c) Acceleration (d) Time period (d) Frequency
3. Describe the wave motion? What are longitudinal and transverse waves?
4. Explain the terms associated with waves (a) Wave velocity (b)Frequency (c) Wavelength
5. What do you understand by progressive waves? Explain the principle of superposition of waves and beat formation.
6. What do you understand by reverberation and reverberation time?
7. Discuss about coefficient of absorption of sound.

PAPER NAME: INTRODUCTION TO IT SYSTEMS
PAPER CODE: ES 102

1. What is an OS? Write down the types of OS.
2. Explain Architecture of OS?
3. Advantages and disadvantages OS.
4. First-Come, First-Served (FCFS) Scheduling .
5. Consider the set of 4 processes whose arrival time and burst time are given below calculate average waiting time for each process.

Process No.	Arrival Time	Burst Time		
		CPU Burst	I/O Burst	CPU Burst
P1	0	3	2	2
P2	0	2	4	1
P3	2	1	3	2
P4	5	2	2	1

PAPER NAME: FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING
PAPER CODE: FEEE

1. State the working principles of the following machines:
   (a) D.C. generator,   (b) transformer.
2. What are the advances of three phase system over single phase system.
3. State and explain lenz's law.
4. Comparison between electric circuit and magnetic circuit.
5. Define crest factor. Why starter is used to start a motor?
6. Differentiable alternating current (A.C) and direct current (D.C) supply

PAPER NAME: ENGINEERING MECHANICS
ENGINEERING PAPER CODE: EM

1. Define velocity ratio,mechanical advantage & efficiency of a simple lifting machine.
2. Find the resultant of both magnitude & direction of two coplanar concurrent forces P & Q acting at an angle of α .
3. A) State Varignon's theorem.
   B) Determine the horizontal force P to be applied to a block of weight 450N to hold it in position on a smooth inclined plane which makes an angle 30^0 with horizontal.
4. An oil drum of 50cm dia & 2m long is to be rolled across a footstep of 10cm high. Find the minimum push required at the top of the drum. Take density of oil as 1.5kg/lit.Neglect weight of the drum.
5. A uniform rod of 8m length has self weight of 6 kN. The rod carried a weight of 25kN hung from one of its end. From what point each the rod to be suspended so that the rod remain horizontal.
6. A body resting on a rough horizontal plane, required a pull of 120N inclined at 30^0 to the plane just to move it.It was found that a push of 160 N inclined at 30^0 to the plane just to move it. Determine the weight of the body & the co-efficient of friction.
7. State the law of relating to static friction. An uniform ladder of 5m long rests on a horizontal ground floor & lean against a smooth vertical wall at angle of 60^0 with the horizontal. The weight of the ladder is 300N acts at the middle.The ladder is at the point of sliding,when a man weighing 150N stands on a rung of 2 m from the bottom of the ladder. Calculate the co-efficient of friction between the ladder & the floor.
8. Define moment, couple, transmissibility of a force & centroid of a plane area.
9. An T-section has the following dimensions are in cm units:
   Top flange   =   15x5
   Web   =   30x5
   Determine the position of centroid of the given section.

10. In differential pulley block, A load of 800 N is raised by an effort of 100N. The no of teeth on the larger and smaller block are 18 & 16 respectively. Find the velocity ratio, mechanical advantage and efficiency of machine.
11. In a simple machine, whose velocity ratio is 40, a load of 1500N is lifted by an effort of 100N & a load of 2500N is lifted by an effort of 160N. Find the law of the machine. Also calculate the load that can be lifted by an effort of 200N.

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ALL-2ND SEM-PRACTICAL

PAPER NAME: APPLIED PHYSICS-II LAB
PAPER CODE: BS-106

1. Discuss about the oscillation of a cantilever for a given time period.
2. Explain the laws of refraction (Snell's law) using a glass slab
3. Describe the wave motion? What are longitudinal and transverse waves?
4. Discuss the Ohm's law for a given current and potential difference.
5. What is half deflection method?

PAPER NAME: INTRODUCTION TO IT SYSTEMS LAB
PAPER CODE: ES-102

1. Let the page fault service time be 10 ms in a computer with average memory access timebeing 20 ns. If one page fault is generated for every 106 memory accesses, what is the effective access time for the memory ?
2. What is a race condition ? Illustrate with example why the presence of race condition is considered as bad design ?
3. How is process management achieved in UNIX ?
4. Explain how TLB is useful in implementing page table.
5. Write short notes on RAID and its level. Also explain stripping and Mirroring.

PAPER NAME: FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING LAB
PAPER CODE: FEEE

1. Determine the permeability of magnetic material by plotting its BH curve.
2. Measure voltage, current and power in a 1-phase circuit with resistive load.
3. Visualize phase difference between voltage and current in series R-L and R-C circuits with the help of oscilloscope and plot the phasor diagram.
4. Measure voltage, current, power and power factor in a R-L series circuit.

PAPER NAME: ENGINEERING MECHANICS LAB
PAPER CODE: LEM

1. State & proof   i) Parallelogram law of force. i) Polygon law of forces. ii) Varignon's Theorem of coplanar forces.
2. What is the function of screw jack? Explain with neat sketch the working function of screw jack. Deduce efficiency of screw jack.
3. State the laws relating to static friction. What is co-efficient of friction explain it.
4. Explain what is mechanical advantage, velocity ratio & efficiency of simple lifting machines.
5. With neat sketch explain construction & working function of single purchase crab winch.

CIVIL-4TH SEM-THEORY

PAPER NAME: HYDRAULICS
PAPER CODE: CE-PC-401

1. If the atmospheric pressure on the surface of an oil tank (sp. gr. 0.8) is 0.1 kg/cm^2, then what will be pressure at a depth of 2.5 m?
2. What is the main cause of failure of hydraulic structure?
3. What are components of hydraulic structure?
4. What are hydraulic gradient and total energy line?
5. Write down Bernoulli's equation and Euler's equation in the differential form for the motion of liquid?
6. Write down some environmental problems caused by dams.
7. What are metacentre and meta centric height?
8. A vessel 4cum. Contains an oil which weighs 30kn.Then what will be specific weight of the oil ?
9. Find out the height of water column equivalent to pressure of 0.15Mpa.
10. write the relation between viscosity, shear force and velocity gradient.

PAPER NAME: ADVANCE SURVEYING
PAPER CODE: CE-PC-402

1. Discuss about plane survey and Geodetic survey.
2. Write the name of different type of classification of survey.
3. Discuss about two principle of survey.
4. Discuss about theodolite and its types.
5. Discuss about centering and orientation.
6. Discuss about face left and face right condition.
7. What is local attraction.
8. What is magnetic declination.
9. What is levelling?
10. What is azimuth.

PAPER NAME: THEORY OF STRUCTURE
PAPER CODE: CE-PC-403

1. What is column?
2. What is struct?
3. What is the difference between buckling and bending?
4. What is long column?
5. What is short column?
6. Write down the Euler 's expression for column?
7. Write down the Rankine 's formula for column?

PAPER NAME: GEOTECHNICAL ENGINEERING
PAPER CODE: CE-PC-404

1. Write short notes transported soil.
2. What is specific gravity of soil.
3.Write short notes on i) Relative density ii) Relative compaction
4. A soil mass having porosity 40% then what will be void ratio?
5. Discuss about plastic limit and liquit limit of soil

6. Write short note on degree of saturation of soil
7. Write a short notes on classification of soil based on particle size
8. Write a short note about unit weight of soil.
9. What is consistency index of soil
10. What is activity of clays?

PAPER NAME:- DESIGN OF RCC & STEEL STRUCTURE
PAPER CODE : CE-PC-405

1. What is Limit state Method?
2. What is Working stress Method?
3. What are the advantages of RCC?
4. What is balanced section in RCC?
5. What is Over reinforced section in RCC?
6. What is under reinforced section in RCC?
7. What is the difference between singly and double reinforced beam?

PAPER NAME:- PRECAST & PRESTRESSED CONCRETE
PAPER CODE : CE-PE-408/I

1. Discuss about prestressed concrete.
2. Discuss about precast concrete.
3. Write about advantage and disadvantage of prestressed concrete.
4. Write about different method of pre-tensioned concrete.
5. Discuss about different method of post-tensioned concrete.
6. Discuss about thermal expansion of concrete.
7. Discuss about the difference between pre tensioned and post tensioned concrete.

CIVIL-4TH SEM-PRACTICAL
PAPER NAME : BASIC SURVEYING FIELD PRACTICES
PAPER CODE : CE-PC-406S

1. What is the difference between surveying and levelling.
2. Write down the procedure of compass survey.
3. Discuss about the equipments of plane table survey.
4. Write down the working principle of theodolite.

PAPER NAME : HYDRAULICS LAB
PAPER CODE : CE-PC-407S-I

1. Explain: Specific weight, capillarity of water, fluid pressure, discharge, velocity
2. Write down Pascal's law.
3. Discuss about the types of flow.
4. Write down Bernoulli's theorem.

<p align="center">**PAPER NAME : GEOTECHNICAL ENGINEERING LAB**</p>
<p align="center">**PAPER CODE : CE-PC-407S/II**</p>

1. Write down aim and procedure of compaction test of soil
2. Write down the procedure to determine the atterberg limit test of soil.
3. Write down the test procedure of core cutter method to determine dry density of soil

<p align="center">**CST-4TH SEM-THEORY**</p>
<p align="center">**PAPER NAME : OPERATING SYSTEMS**</p>
<p align="center">**PAPER CODE : COPC 202**</p>

1. Explain Multiple Tasks and Multiple Processes?
2. Explain Context Switching?
3. Explain Inter process Communication Mechanism?
4. What is the difference between Deadlock Prevention and Deadlock Avoidance in an operating system?
5. Introduced Banker's Algorithm?

<p align="center">**PAPER NAME : INTRODUCTION TO DBMS**</p>
<p align="center">**PAPER CODE : COPC 204**</p>

1. What is DBMS? Define Database.
2. What are the features of Database language?
3. Enlist the various relationships of database.
4. What restrictions can you apply when you are creating views?
5. Differentiate Nested Loop, Hash Join and Merge Join.

<p align="center">**PAPER NAME : COMPUTER NETWORKS**</p>
<p align="center">**PAPER CODE : COPC 206**</p>

1. What are the three criteria necessary for an effective and efficient network?
2. What is LAN? Define Error detection and correction.
3. Define HTTP. What are the types of messages in HTTP transaction?
4. What is POP? How does MIME enhance SMTP?
5. Explain ISO/OSI reference model.

<p align="center">**PAPER NAME : SOFTWARE ENGINEERING**</p>
<p align="center">**PAPER CODE : COPC 208**</p>

1. What is the main difference between a computer program and computer software?
2. What are SDLC models available? Explain the verification and validation.
3. Explain the Waterfall model in detail.
4. Explain V-Model in detail.
5. Briefly describe the types of project management approaches and methodologies.

PAPER NAME : OBJECT ORIENTED PROGRAMMING USING JAVA
PAPER CODE : COPC210

1. Explain Java Applets and Applications.
2. What are the differences between the constructors and methods?
3. What is the difference between JDK, JRE, and JVM?
4. How many types of memory areas are allocated by JVM?
5. What is the difference between an object-oriented programming language and object-based programming language?

CST-4TH SEM-PRACTICAL
PAPER NAME : OPERATING SYSTEMS LAB
PAPER CODE : COPC 212

1. Difference between network operating system and distributed operating system.
2. Explain Hybrid Kernel.
3. Write Advantages & Disadvantages of Network Operating System.
4. Explain Distributed Operating System.
5. Write down the Batch Operating system.

PAPER NAME : INTRODUCTION TO DBMS LAB
PAPER CODE : COPC 214

1. Discuses the DCL in SQL.
2. Explain E-R Model.
3. Write down the executing string operators & string functions.
4. How to use a DBMS in Commercial applications.
5. Write a Program using nested loop in Pl/SQL.

PAPER NAME : COMPUTER NETWORKS LAB
PAPER CODE : COPC 216

1. Explain each topologies of the network .

2. Explain error detection and error correction techniques.

3. Explain UDP &TCP .

4. Explain about congestion control.

5. Explain the WWW in detail.

PAPER CODE : OBJECT ORIENTED PROGRAMMING LAB USING JAVA
PAPER CODE : COPC218

1. Write a program in Java to find second maximum of n numbers.
2. Write a program in Java in which a subclass constructor invokes the constructor of the super class and instantiate the values.
3. Write a program in Java to demonstrate implementation of multiple inheritance using interfaces.
4. Write a program in Java to demonstrate use of final class.
5. Write a program in Java to develop user defined exception for 'Divide by Zero' error.

EE-4TH SEM-THEORY
PAPER NAME : POWER ELECTRONICS CONVERTERS & APPLICATION
PAPER CODE : EEPC202

1. What is chopper? How they are classified?
2. State the thyristor turn on methods.
3. Describe the static I-V characteristics of a thyristor.
4. Describe the working of a single phase half bridge inverters.
5. What is meant by step up chopper? Explain its operation.
6. Describe the working principle of Dual converter.

PAPER NAME : ELECTRIC POWER TRANSMISSION & DISTRIBUTION
PAPER CODE : EEPC206

1. What are the different types of insulator?- explain any one.
2. Write short note on Kelvin's Law and its limitation.
3. Write a short note on Skin effect, proximity effect.
4. Why is it disadvantageous to provide either too high sag or too low sag? What is stringing chart?
5. Discuss in brief, the factors on which sag of the OH line depends.
6. Write a short note on AC inter connected systems.

PAPER NAME : INTRODUCTION, SYNCHRONOUS AND SPECIAL ELECTRICAL MACHINES
PAPER CODE : EEPC210

1. Explain the operation of the different types of stepper motors.
2. Explain the regenerative Braking of 3-phase induction motor.
3. Describe any two methods of determining the voltage regulation of 3-phase Alternator.
4. Draw the typical torque slip curve and deduce the condition for maximum torque.
5. Explain about crawling and cogging.
6. Derive the equation for torque developed by an Induction Motor.

PAPER NAME : RENEWABLE ENERGY POWER PLANTS
PAPER CODE : EEPC214

1. Draw the schematic diagram of a thermal power station and discuss its operation.
2. Discuss about classification of water turbine.
3. Explain the working of a gas turbine power plant with a schematic diagram.
4. Discuss different bio-mass energy resources.
5. Explain single dome system.
6. What are the major applications of geothermal energy and explain various types of geothermal resources.

PAPER NAME : SWITCHGEAR AND PROTECTION
PAPER CODE : EEPE202

1. Discuss in detail about the fault bus protection by using circuit diagram.
2. What is protective relay? Describe the basic requirements of protection system.
3. Write the difference between Fuse and Circuit Breaker.
4. What are the properties of Arc struck in the circuit breaker?

5. What do you understand by short circuit?
6. Discuss the possible cause of short-circuit in the power system.

EE-4TH SEM-PRACTICAL
PAPER NAME : POWER ELECTRONICS CONVERTERS & APPLICATION LAB
PAPER CODE : EEPC204

1. Test the proper functioning of power electronic switches – SCR, IGBT, SCS and TRIAC.
2. Test the proper functioning of DIAC to determine the break over voltage.
3. Determine the latching current and holding current using V-I characteristics of SCR.
4. Test the variation of R, C in R and RC triggering circuits on firing angle of SCR.
5. Test the effect of variation of R, C in UJT triggering technique.
6. Perform the operation of Class – A, B, C turn off circuits.

PAPER NAME : ELECTRIC POWER TRANSMISSION & DISTRIBUTION
PAPER CODE : EEPC208

1. Study samples of Overhead Conductors, Underground Cables, Line supports and Line Insulators.
2. Demonstrate various system faults by D.C. network analyzer.
3. Demonstrate the improvement of p.f. using static condenser.
4. Study of distribution simulator using power transmission trainer.

PAPER NAME : INTRODUCTION, SYNCHRONOUS AND SPECIAL ELECTRICAL MACHINES LAB
PAPER CODE : EEPC212

1. Identify the different parts (along with function and materials) for the given single phase and three phase induction motor.
2. Perform the direct load test on the three phase squirrel cage induction motor and plot the i) efficiency versus output, ii) power factor versus output, iii) power factor versus motor current and iv) torque – slip/speed characteristics efficiency versus output, v) power factor versus output, vi) power factor versus motor current and vii) torque – slip/speed characteristics.
3. Conduct the No-load and Blocked-rotor tests on given 3-phase squirrel cage induction motor and determine the equivalent circuit parameters.
4. Control the speed of the given three phase squirrel cage induction motor using the applicable methods: i) autotransformer, ii) VVVF.
5. Measure the open circuit voltage ratio of the three-phase slip ring induction motor and perform the speed control by insertion of resistance in rotor circuit for slip ring induction motor.

PAPER NAME : RENEWABLE ENERGY POWER PLANTS LAB
PAPER CODE : EEPC216

1. Perform experiment to measure solar radiation using Pyranometer on tilted surface at different angles of inclination and plot radiation vs. time characteristics for certain duration.
2. Perform experiment to plot I-V characteristics of photovoltaic cell module and find out the solar cell parameters (O.C. voltage, Short circuit current, Voltage-current-power at Maximum Power point, Fill factor, Efficiency).
3. Study different parts of a solar flat plate collector/ solar concentrating collector.
4. Perform experiment to measure thermal performance of a solar water heating system.
5. Perform experiment to measure thermal performance of a solar cooker with varying reflector.
6. Identify & study different components of solar street lighting system for AC supply.

1. Testing of static Overcurrent protection relay using Relay Testing Kit.
2. Test HRC fuse by performing the load test
3. Test MCB by performing the load test
4. Dismantle MCCB/ELCB/ RCCB and identify various parts
5. Testing of Induction type/ Microprocessor Based Over Current relay using Relay Testing Kit to plot the inverse characteristics.
7. Testing of static distance protection relay using Relay Testing Kit.

ME-4TH SEM-THEORY
PAPER NAME : THERMAL ENGINEERING –II
PAPER CODE : MEPC206

1. Define the Psychometric? Explain the Dalton's law of Partial Pressures
2. What is a steam boiler? What are the differentiating features between a water tube and a fire tube boiler?
3. Explain the working principle of Carnot cycle with vapour representing on P-V and T-s diagram. Why Carnot cycle cannot be used in practical engines?
4. A single stage reciprocating air compressor is required to compress 1kg of air from 1 bar to 4 bar. The initial temperature is 27^0 C. compare the work requirement in the following cases: a) Isothermal compression, b) Isentropic compression.
5. With a neat sketch explain the working principle of Bell-Coleman cycle for air refrigeration. Draw P-V and T-s diagram.
6. Describe briefly any two of the following processes   a) sensible heating b) sensible Cooling   c) Heating & humidification
7. Describe briefly VCR Cycle with T-s and p-h diagram.
8. Explain the terms forced draught,induced draurght .
9. Prove that for natural draught h=353H[(1/Ta) –{ (m+1)/m}1/Tg]
10. What are the desirable properties of refrigerants? Explain name at least five commercial refrigerants.
11. Explain the construction and working of a La Mount boiler with the help of a neat sketch.
12. Compare reciprocating compressor with a rotary compressor.
13. Describe the construction and working principle of a vane-type compressor.
14. A boiler generates 500kg/hr of steam at 16 bar and 300^0 C from feed water at 30^0C coal used is 60kg/hr of C.V. 30000kj/kg, find a) equivalent evaporation and b) boiler efficiency.

PAPER NAME : MANUFACTURING PROCESSES-II
PAPER CODE : MEPC204

1. Find the time required on a shaping machine for completing one cut on a plate 200mmx300mm if the cutting speed is 10mm/ unit. The return to cutting time ratio is 2:3. Assume approach =50mm, over travel =25mm, allowance on either side of the plate width =5mm and feed/ cycle = 1mm.
2. How to specify a lathe. Describe various lathe parts.
3. Specify a planning machine.
4. Write the difference between shaper and planer.
5. What are taper and taper turning. Write the name of different taper turning method and describe any one of them.
6. Calculate the change gears to cut R.H. threads of 35 T.P.I. on a lathe having a lead screw of 8 T.P.I.

7. Calculation cutting time for cutting 250mm long key way using end mill of 40mm diameter having 10 cutting teeth. The depth of key way is 6.5 mm, feed/ tooth is 0.25 and cutting speed is 48mm /min. Assume approach and over travel distance as half of the diameter of the cutter and a depth of cut 5.2mm/pass.
8. State the nomenclature of twist drill. How to specify a drilling machine.
9. Describe various milling operations.
10. Specify the 250x25x27WA46L4V17 notation of a grinding wheel.
11. Describe various types of bond used in grinding wheel.
12. What are the differences between lapping and honing. What is plastic? Distinguished between thermo plastic and thermo setting plastic.
13. Define cutting speed, feed and depth of cut including their units in case of shaping machine

PAPER NAME : REFRIGERATION AND AIR CONDITIONING
PAPER CODE : MEPE202/1

1. Describe the C.O.P of refrigerator and heat pump. Obtain the relation between them.
2. Explain 'Reverse Brayton cycle' with P-V and T-S diagram. Determine the COP.
3. Discuss the working principle of 'air-craft refrigeration' by using simple air cooling system with flow diagram.
4. Discuss the working principle of simple vapour compression refrigeration system with T-S and P-H diagram .
5. What is the effect on the performance of refrigerator when,
   a) Change in suction pressure in refrigerant.
   b) Sub cooling or under cooling of refrigerant after condensation.
6. Explain the method of installation of refrigeration system in car.
7. Write short note on various types of compressors. Explain any one with neat sketch.
8. Discuss the flow diagram and working principle of ice plant.
9. Discuss the working principle of Electrolux refrigeration system with flow diagram.
10. Discuss the working principle of air washer with flow diagram.
11. Describe briefly any two of the following processes   a) sensible heating b) sensible Cooling   c) Heating & humidification
12. A refrigeration system operates on the reversed Carnot cycle. The higher temperature of the refrigerant in the system is 25° C and lower temperature is -5° C. The capacity is to be 6 tonnes. neglect all losses. Determine, a)Coefficient of performance. b) Heat rejected from the system per hour, c)power required.
13. What are the desirable properties of refrigerants? Explain name at least five commercial refrigerants.
14. Explain is humidifier and dehumidifier.
15. Discuss the factors effecting human comfort.

PAPER NAME : ENGINEERING METROLOGY
PAPER CODE : MEPC208

1. Name and sketch different types of fits.
2. Write the definition of Allowance, Tolerance, Fit, Zero limit and Nominal size.
3. Discuss taylor's principle of gauge design.
4. State the working principle of plain plug gauge.
5. Calculate the limit of tolerance and allowance for a 25mm shaft and hole pair designated by **H8d9**.
6. What is hole and shaft basis system? Which system have more advantage and why?

7. What type of basis size limiting system used in metrology measurement and describe them with example.
8. State the construction and working principle of a Universal Bevel Protractor.
9. State the construction and working principle of a Dial indicator.
10. State the working principal of optical encoder.
11. Describe how to test flatness by dial gauge.
12. Show the various symbols for designating surface finish on drawing.
13. In a screw thread show major diameter, minor diameter, effective diameter, pitch and thread angle.
14. Describe about two wire method.
15. State the construction and working principle of screw thread micrometer.

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PAPER NAME : THEORY OF MACHINES
PAPER CODE : MEPC202

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1. What do you understand by instantaneous centre of rotation in kinematic of machines?
2. Discuss the three types of instantaneous centers for a mechanism.
3. Explain the slotted and lever quick return motion mechanisms with neat sketches
4. Define Cam and Follower. A cam drives a flat reciprocates follower is the following manner: During the first 120° rotation of the cam, follower moves outwards through a diameter of 20 mm with simple harmonic motion. The follower dwells during next 30° of cam rotation .During next 120° of cam rotation, the follower moves inward with simple harmonic motion. The follower dwells for the next 90° of cam rotation. The minimum radius of the cam is 25mm.Draw the profile of cam.
5. Why we use Belt drive ? State the types of belt drives and explain the various types belt drive material. Also state the factors for selection of belt drive.
6. Derive the equation for Velocity Ratio of belt drive. Also explain the slip of belt with derivation.
7. An engine running at 150 rpm. , drives a line shaft of a belt. The engine pulley is 750 mm diameter and the pulley on the shaft being 450 mm . A 900 mm diameter pulley on the line shaft drives a 150 mm diameter pulley keyed to a dynamo shaft. Find the speed of the dynamo shaft. When 1). There is no slip , and 2) there is a slip of 2% at each drive.
8. Two pulleys , one 450 mm diameter and the other 200 mm diameter are on parallel shafts 2.95 m apart and are connected by a crossed belt. Find the length of the belt required and the angle of contact between the belt and pulley. What power can be transmitted by the belt when the larger pulley rotates at 200 rev/min , if the maximum permissible tension in the belt drive is 1 KN , and the coefficient of friction between the belt and pulley is 0.25?.
9. Explain rope drive , its types and advantages and disadvantages in detail.
10. A pulley used to transmit power by means of ropes has a diameter of 3.6 m and has 15 grooves of $45^°$ angle.. The angle of contact is $170^°$ and the coefficient of friction between the ropes and grooves sides is 0.29 . The maximum possible tension in the ropes is 960 N and mass of the ropes is 1.5 Kg per metre length. What is the speed of pulley in rpm and the power transmitted if the condition of maximum power prevail ?
11. Define Governors. Explain Centrifugal governors with neat sketch and derivations.
12. In an engine governor of the Porter type , the upper and lower arms are 200 mm and 250 mm respectively and pivoted on the axis of rotation . The mass of the central load is 25 Kg , the mass of each ball is 5 Kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 30 N at the sleeve. If the limiting inclinations of the upper arms to the vertical are $30^°$ and $50^°$, find , taking friction into account , range of speed of the governor.

13. Two parallel shafts , about 600 mm apart are to be connected by spur gears. One shafts is to run at 560 rpm and other at 220 rpm . Design the gears if the circular pitch is to be 35 mm.
14. A single plate clutch , effective on both sides , is required to transmit 25 KW at 4500 rpm . Determine the outer and inner diameters of frictional surface if the coefficient of friction is 0.355 , ratio of diameters is 2.25 and maximum pressure is not to exceed 0.3 N/mm^2 . Also determine the axial thrust to be provided by springs . Assume the theory uniform theory.

ME-4TH SEM-PRACTICAL
PAPER NAME : COMPUTER AIDED MACHINE DRAWING PRACTICE
PAPER CODE : MEPC210

1. What is cad?
2. Draw a rectangular of size 50*35mm. Write the procedure
3. Full form of ucs?
4. Draw a penatgon. Write the procedure.
5. How to select command and start drawing. Write the procedure
6. Write single /multline text with special charcator. Write the procedure
7. How the dimension command is used.

PAPER NAME : THERMAL ENGINEERING –II
PAPER CODE : MEPC212

8. Determination of dryness fraction of steam by combined separating and throttling calorimeter. What is dryness fraction? What is superheated vapour? What do you understand by triple point ? Draw the phase equilibrium diagram for a pure substance on T-S plot with relevant constant property lines.

9. Find the Calorific Value of Diesel Fuel & Coal by Bomb Calorimeter. What is synthetic fuel? How is COM prepared what are the merits of COM as a boiler fuel? What is swelling index and grind ability index of a coal?

10. Determine and draw valve Timing Diagram of a 4S Diesel Engine Model. Write the working principle of 4S diesel engine. Explain fuel injection system of diesel of air injection method.

11. With the help of neat sketch, explain Lancashire Boiler. Explain construction details & working principle of 4S Diesel engine. What is fire tube boiler and write where its suitable for applicable.

12. With the help of neat sketch, explain Cochran Boiler. Explain construction details & working principle of 4S Petrol engine. Write working principle of fire tube boiler and write where its suitable for applicable.

13. With the help of neat sketch, explain Babcock & Willcox Boiler. Explain construction details & working principle of 2S Petrol engine. What is water tube boiler? Write disadvantages of bent tube boiler.

PAPER NAME : ENGINEERING METROLOGY
PAPER CODE : MEPC214

1. a. Write down the working principle of vernier calipers.
   b. Measurement of a specimen by vernier caliper and write procedure with figure of specimen.
2. a. How to get the least count of a micrometer. Discuss.
   b. Measurement of a specimen by micrometer and write procedure with figure of specimen.
3. a. What is vernier height gauge? Calculate the vernier constant of vernier height gauge.

b. Measurement of a specimen by vernier height gauge and write procedure with figure of specimen.

4. a. What is sine bar? Discuss the working principle of sine bar.

b. Measurement angle of specimen by sine bar and write procedure with figure of specimen.

5. a. Write down the working principle of profile projector.

b. Measurement of micro feature of a thread using profile projector.

6. a. What is bevel protector? Write down the principle of bevel protector.

b. Measurement angle of specimen by bevel protector and write procedure with figure of specimen.

PAPER NAME : MANUFACTURING PROCESS-II PRACTICE
PAPER CODE : MEPC216

1. Write the name different parts of lathe with sketch. Explain the various steps involved in the investment casting of metals

2. Describe the process of submerged arc welding stating its advantages and limitations. Discuss the method of underwater welding. What are its advantages and disadvantages?

3. Discuss, with the help of neat sketch, the principle of spot welding. Describe various Drilling machine parts.

4. Using neat sketch, describe the principal parts of the milling machine by neat sketches. Explain various types of milling operations using neat sketches.

5. How will you obtain neutral, oxidizing and reducing flames using welding torch in gas welding? Compare the merits and demerits of using A.C and D.C for arc welding