

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

21ME51

Fifth Semester B.E. Degree Examination, June/July 2024

Theory of Machines

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define the following :
 - (i) Mechanism
 - (ii) Machine
 - (iii) Link
 - (iv) Kinematic pair.
 - (v) Degree of freedom. (10 Marks)
- b. Explain with a neat diagram, the crank and slotted lever mechanism. (10 Marks)

OR

- 2 a. What is completely constrained motion and partially constrained motion? Explain with example. (04 Marks)
- b. In a Slider crank mechanism, the crank OB is 30 mm long and the connecting rod BC is 120 mm long. The crank rotates at a uniform speed of 300 rpm clockwise about center 'O'. For a crank position $\angle BOC$ equal to 60 degree, draw the configuration and find
 - (i) Velocity of position C and angular velocity of connecting rod BC.
 - (ii) Acceleration of Piston C and angular acceleration of connecting rod BC. (16 Marks)

Module-2

- 3 a. Discuss the static equilibrium of,
 - (i) Two forces.
 - (ii) Three forces.
 - (iii) Member with two forces and a torque. (06 Marks)
- b. A four bar mechanism under the action of two external forces is shown in Fig. Q3 (b). Find the required input torque on the link AB for static equilibrium. The dimensions of the links are AB = 50 mm, BC = 66 mm, CD = 55 mm, CE = 25 mm, CF = 30 mm, angle BAD = 60° and AD = 100 mm.

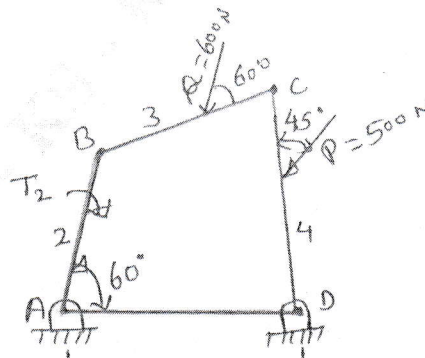


Fig. Q3 (b)

1 of 3

(14 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. $42+8=50$, will be treated as malpractice.

OR

- 4 a. State and explain D'Alembert's principle. (06 Marks)
 b. When the crank is 45 degree from the inner dead centre on the down stroke, the effective steam pressure on the piston of a vertical steam engine is 2.5 bars. The diameter of the cylinder = 0.75 m, Stroke of the piston = 0.50 m and length of the connecting rod = 1 m. Determine the torque on the crank shaft, if the engine runs at 350 rpm and the mass of the reciprocating parts is 200 kg. (14 Marks)

Module-3

- 5 a. State and prove the law of gearing for constant velocity ratio. (10 Marks)
 b. Two involute gears with number of teeth 28 and 45 are in mesh. If they have standard addendum of 3 mm and pressure angle is 20 degree, find the following :
 (i) Path of approach
 (ii) Path of recess
 (iii) Contact ratio.
 Assume module is 3 mm. (10 Marks)

OR

- 6 The arm C of an epicyclic gear train rotates at 100 rpm in anticlockwise direction. The arm carries two wheels A and B having 36 and 45 teeth respectively. The wheel A is fixed and the arm rotates about the centre of wheel A. Find the speed of wheel B. What will be the speed of B, if wheel A instead of being fixed makes 200 rpm clockwise? (20 Marks)

Module-4

- 7 a. Explain briefly static balance and dynamic balance as applied to revolving masses in different planes. (06 Marks)
 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 respectively. The distance from the plane A are 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 at a radius of 100 mm, find their magnitudes and angular positions. (14 Marks)

OR

- 8 a. With usual notations, explain the primary and secondary unbalanced forces of reciprocating masses. (04 Marks)
 b. Derive an expression for speed of a porter governor with usual notations taking friction into account. (08 Marks)
 c. In a spring loaded Hartnell governor the extreme radii of rotation of the balls are 80 mm and 120 mm. The balls arm and sleeve arm of the bell crank lever are equal in length. The mass of each ball is 2 kg. If the speeds at the two extreme positions are 400 rpm and 420 rpm. Find :
 (i) Spring stiffness
 (ii) Initial compression of the control spring.
 (iii) Sleeve lift. (08 Marks)

Module-5

- 9 a. Define logarithmic decrement. Show that logarithmic decrement δ is given by $\frac{2\pi\zeta}{\sqrt{1-\zeta^2}}$ for underdamped system. (08 Marks)
- b. A spring mass damper system has $m = 3$ kg, $K = 100$ N/m, $C = 3$ N-sec/m. Determine
- Damping factor
 - Natural frequency of damped vibration.
 - Logarithmic decrement.
 - The ratio of two successive amplitudes.
 - Number of cycles after which the original amplitude is below 20%. (12 Marks)

OR

- 10 a. Derive an expressions for the natural frequency of free transverse vibration for a simply supported beam or shaft carrying several loads by using,
- Dunkerley's method.
 - Energy method. (10 Marks)
- b. The following data relate to a shaft held in long bearings :
- Length of shaft = 1.2 m
 Diameer of shaft = 14 mm
 Mass of a rotor at mid point = 16 kg
 Eccentricity of centre of mass of rotor from centre of rotor = 0.4 mm
 Modulus of elasticity of shaft material = 200 GN/m²
 Permissible stress in shaft materials = 70×10^6 N/m²
 Determine the critical speed of the shaft and the range of speed over which it is unsafe to run the shaft. Assume the shaft to be mass less. (10 Marks)

* * * * *

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

21ME52

Fifth Semester B.E. Degree Examination, June/July 2024 Thermo Fluids Engineering

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of steam tables and thermodynamics Data Hand Book is permitted.**

Module-1

- 1 a. Explain clearly how the frictional power of a multi cylinder Internal Combustion Engine can be determined through Morse Test. (10 Marks)
- b. The following data were obtained from a Morse test on a 4 cylinder 4 stroke cycle SI engine coupled to a hydraulic dynamometer operating at a constant speed of 1500 rpm :
- Brake load with all 4 cylinders firing = 296 N,
Brake load with cylinder 1 not firing = 201 N,
Brake load with cylinder 2 not firing = 206 N,
Brake load with cylinder 3 not firing = 192 N,
Brake load with cylinder 4 not firing = 200 N.

The brake power in kW is calculated using the equation $BP = \frac{WN}{42300}$, where W = Brake

load in Newton, N = Speed of the engine in rpm. Calculate :

- (i) Brake power (ii) Indicated power
(iii) Frictional power (iv) Mechanical efficiency (10 Marks)

OR

- 2 a. Obtain an expression for the volumetric efficiency of a single stage reciprocating air compressor in terms of the pressure ratio, the clearance ratio and the index of expansion. (10 Marks)
- b. Air at 1 bar and 27°C is compressed to 7 bar by a single stage reciprocating compressor according to the law $P\gamma^{1.3} = \text{constant}$. The free air delivered was 1m³/min. Speed of the compressor is 300 rpm. Stroke to bore ratio is 1.5 : 1. Mechanical efficiency is 85% and motor transmission efficiency is 90%. Determine :
- (i) Indicated power and isothermal efficiency
(ii) Cylinder dimensions and power of the motor required to drive the compressor. (10 Marks)

Module-2

- 3 a. Define the following terms with respect to refrigeration :
- (i) Refrigerating effect.
(ii) Unit of refrigeration.
(iii) COP. (06 Marks)
- b. With the help of a neat sketch, explain the working principle of a vapour absorption refrigeration system. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

- c. In an air refrigeration plant working on a reversed Brayton cycle, air enters the compressor at 1 bar and -15°C where it is compressed to a pressure of 5.5 bar. Air enters the expander at 15°C . Determine :
- COP of the cycle
 - Mass flow rate of air into the compressor per minute for one ton of refrigeration. Assume both compression and expansion processes as isentropic. (06 Marks)

OR

- 4 a. Define the following terms with respect to psychrometry :
- Specific humidity (04 Marks)
 - Relative humidity. (08 Marks)
- b. With a neat sketch, explain the working of summer air conditioning system for hot and dry weather. Represent the processes involved on a psychrometric chart. (08 Marks)
- c. Atmospheric air at 1.01325 bar has 30°C DBT and 15°C DPT. Without using the psychrometric chart, using the property values from the tables, calculate
- Partial pressure of air and water vapour
 - Specific humidity
 - Relative humidity
 - Enthalpy of moist air. (08 Marks)

Module-3

- 5 a. Define a turbo machine. Differentiate between a turbo machine and a positive displacement machine. (08 Marks)
- b. Identify the following as power generating or power absorbing turbomachine :
- Francis turbine
 - Centrifugal blower
 - Centrifugal compressor
 - De-Laval turbine. (04 Marks)
- c. With inlet and outlet velocity triangles and with usual notations, derive the alternate form of Euler's turbine equation for a general turbo machine. (08 Marks)

OR

- 6 a. Describe the principle and working of a reciprocating pump with a neat sketch. (08 Marks)
- b. Define the following terms with respect to reciprocating pump :
- Slip
 - Percentage slip
 - Negative slip. (06 Marks)
- c. With a neat sketch, explain the working principle of a gear pump. (06 Marks)

Module-4

- 7 a. Define the following efficiencies of a hydraulic turbine :
- Hydraulic efficiency
 - Mechanical efficiency
 - Overall efficiency. (06 Marks)
- b. Explain the different parts and functioning of a Kaplan turbine with the help of a sectional arrangement diagram. (06 Marks)
- c. A three jet Pelton wheel is required to generate 10,000 kW under a head of 400 m. The blade angle at outlet is 15° and the reduction in the relative velocity over the buckets is 5%. If the overall efficiency = 80%, $C_v = 0.98$ and speed ratio = 0.46, find :
- Diameter of each jet
 - Total flow rate
 - Force exerted by a jet on the buckets. (08 Marks)

OR

- 8 a. What is Cavitation? What are the causes of Cavitation? What are steps to be taken to reduce the effect of Cavitation? (04 Marks)
- b. Explain with flow diagram, the purpose of multi stage pump when connected in,
- Series
 - Parallel. (08 Marks)

- c. A Centrifugal pump is running at 1000 rpm. The outlet vane angle of the impeller is 45° . The velocity of flow at the outlet is 2.5 m/s. The discharge through the pump is $0.2 \text{ m}^3/\text{s}$ when the pump is working against a head of 20 m. If the manometric efficiency is 80%, draw the outlet velocity diagram and calculate :
- The diameter of the impeller at the outlet.
 - Width of the impeller at the outlet.
- (08 Marks)

Module-5

- 9 a. Define the following with respect to centrifugal compressor :
- Power input factor
 - Pressure coefficient
 - compressor efficiency.
- (06 Marks)
- b. Explain the following with appropriate sketches :
- Surging.
 - Choking.
- (06 Marks)
- c. A centrifugal compressor runs at a speed of 15000 rpm and delivers 30 kg/s of air. The exit diameter is 70 cm. The relative velocity at exit is 100 m/s at an exit angle of 75° . Assume axial inlet and consider the inlet total temperature as 300 K, inlet total pressure as 1 bar. Determine :
- Power required to drive the compressor
 - Ideal head developed
 - Work done
 - Total exit pressure
- (08 Marks)

OR

- 10 a. Explain the following methods of compounding of steam turbines :
- Velocity compounding
 - Pressure compounding.
- (10 Marks)
- b. A single stage impulse turbine rotor has a diameter of 1.2 m running at 3000 rpm. The nozzle angle is 18° . The blade speed ratio is 0.42. The ratio of the relative velocity at outlet to the relative velocity at inlet is 0.9. The outlet angle of the blade is 3° less than the inlet angle. Steam flow rate is 5 kg/s. Draw the velocity triangles and find :
- Blade angles
 - Axial thrust on bearing
 - Power developed
 - Blade efficiency.
- (10 Marks)

* * * * *

USN

--	--	--	--	--	--	--	--	--	--

21ME53

Fifth Semester B.E. Degree Examination, June/July 2024 Finite Element Analysis

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define FEA. Explain the basic steps involved in problem solving in FEA. (10 Marks)
- b. A rectangular bar is subjected to an axial load 'P' as shown in Fig. Q1 (b). Determine the expression for potential energy functional and also find the extreme value of P.E. for the following data :
- $E = 200 \text{ GPa}$, $P = 3 \text{ kN}$, $L = 100 \text{ mm}$, $b = 20 \text{ mm}$, $t = 10 \text{ mm}$.

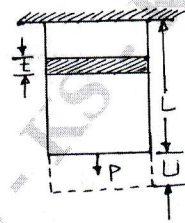


Fig. Q1 (b)

(10 Marks)

OR

- 2 a. Explain plane stress and plane strain problems with suitable examples. (10 Marks)
- b. Explain Simplex, Complex and Multiplex elements. (10 Marks)

Module-2

- 3 a. With usual notations, obtain the expression for shape functions of a 1-D Quadratic bar element in Natural co-ordinate system. (10 Marks)
- b. Write the set of commands employed in ANSYS software to perform structural analysis for a uniform bar structure as shown in Fig. Q3 (b).

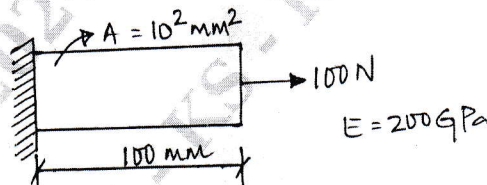


Fig. Q3 (b)

(10 Marks)

OR

- 4 a. Determine the nodal displacement and elemental stresses for a bar subjected to uniform distributed load 'P₀' as shown in Fig. Q4 (a). Given $E = 70 \text{ GPa}$ and $A = 10^4 \text{ mm}^2$.

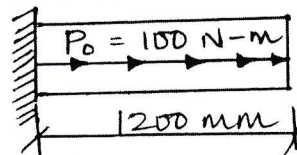


Fig. Q4 (a)

(10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- b. Determine the nodal displacement and elemental stresses for a truss as shown in Fig. Q4 (b). Given $A = 200 \text{ mm}^2$ and $E = 2 \times 10^5 \text{ N/mm}^2$.

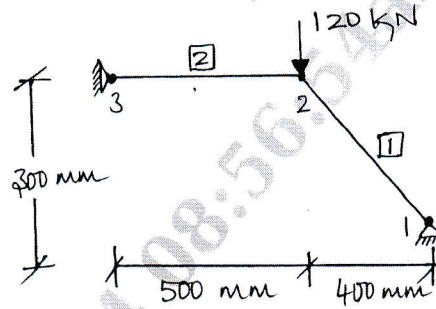


Fig. Q4 (b)

(10 Marks)

Module-3

- 5 a. Derive the Hermite shape functions for a beam element. (10 Marks)
 b. A Cantilever beam subjected to a point load of 250 kN as shown in Fig. Q5 (b). Determine the deflection at the free end and support reactions. Take $E = 200 \text{ GPa}$ and $I = 4 \times 10^6 \text{ mm}^4$.

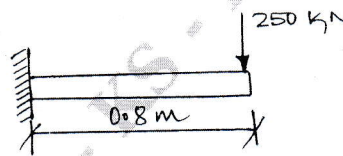


Fig. Q5 (b)

(10 Marks)

OR

- 6 a. Derive the stiffness matrix for a circular shaft subjected to pure torsion. (10 Marks)
 b. A solid stepped bar of circular cross section is subjected to a torque of 1 kN-m at its free end and to a torque of 3 kN-m at its change in cross section as shown in Fig. Q6 (b). Determine the angle of twist and shear stresses in the bar. Take $E = 2 \times 10^5 \text{ N/mm}^2$ and $G = 7 \times 10^4 \text{ N/mm}^2$.

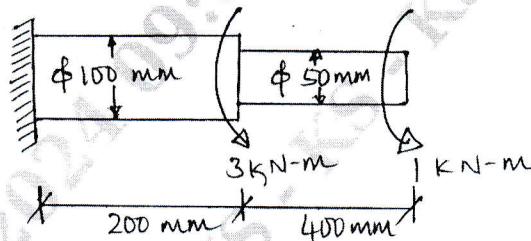


Fig. Q6 (b)

(10 Marks)

Module-4

- 7 a. With usual notations, derive the differential equation for 1-D heat conduction body. (10 Marks)
 b. Determine the temperature distribution in the rectangular fin as shown in Fig. Q7 (b). Assume steady state and only conduction process. Take heat generated inside the fin as 400 W/m^3 .

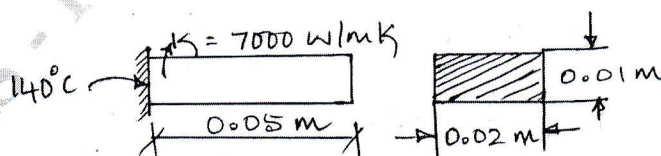


Fig. Q7 (b)

(10 Marks)

OR

- 8 a. With usual notations, derive the differential equations for a fluid flow through a porous medium. (10 Marks)
- b. For a smooth pipe with uniform cross section of 1 m^2 ; determine the flow velocities at the centre and at the right end of the Fig. Q8 (b). Given velocity at the left is 2 m/sec .

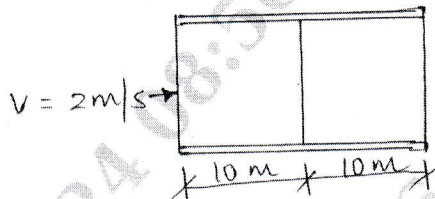


Fig. Q8 (b)

(10 Marks)

Module-5

- 9 a. Derive an expression for the body force vector of an axisymmetric solid element. (10 Marks)
- b. For the element of an axisymmetric body rotating with a constant angular velocity $\omega = 1000 \text{ rpm}$ as shown in Fig. Q9 (b). Determine the body force vector by considering the specific density as 7850 kg/m^3 .

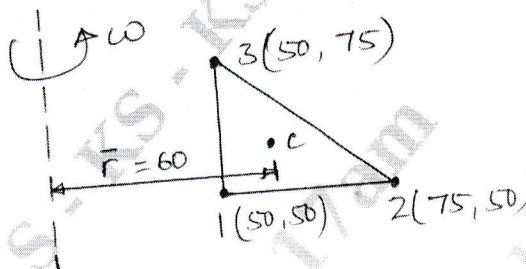


Fig. Q9 (b)

(10 Marks)

OR

- 10 a. With usual notations, derive the consistent element mass matrices equation for a 1-D bar element. (10 Marks)
- b. Determine the natural frequency of vibration of the Cantilever beam as shown in Fig. Q10 (b). Take $E = 200 \text{ GPa}$, $\rho = 7840 \text{ kg/m}^3$; $I = 2000 \text{ mm}^4$ and $A = 240 \text{ mm}^2$.

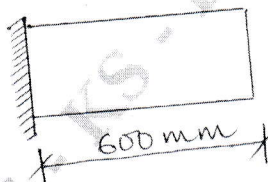


Fig. Q10 (b)

(10 Marks)

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

21ME54

Fifth Semester B.E. Degree Examination, June/July 2024 Modern Mobility and Automotive Mechanics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-1

- 1 a. List the components of automotive engine. Mention their functions and materials used for manufacturing. (07 Marks)
- b. What is the necessity of cooling valve? Explain sodium cooled valve with neat sketch. (06 Marks)
- c. What are the functions of the lubricating system in an automobile? Explain with a neat sketch the splash lubricating system. (07 Marks)

OR

- 2 a. Explain with a neat sketch, working of a battery ignition system. (08 Marks)
- b. Explain different method of supercharging. (08 Marks)
- c. Explain the function of Engine Management System (EMS). (04 Marks)

Module-2

- 3 a. With a neat sketch, explain the working of telescopic type shock absorber. (06 Marks)
- b. Difference between torque converter and fluid flywheel. (06 Marks)
- c. What is the function of differential? Explain its operation with neat diagram. (08 Marks)

OR

- 4 a. Explain with neat sketch, single plate clutch. (06 Marks)
- b. Explain the followings:
 - (i) Automatic Manual Transmission (AMT) (08 Marks)
 - (ii) Automatic Transmission (AT) (06 Marks)
- c. Explain with neat sketch types of rear axles.

Module-3

- 5 a. Define the following and explain their effects on steering:
 - (i) Camber
 - (ii) King pin angle or steering axis inclination
 - (iii) Castor
 - (iv) Toe-in and Toe-out
 - (v) Included angle and scrub radius (10 Marks)
- b. Explain the principle of braking system. Write the functions of Brake and its requirement in automobile. (06 Marks)
- c. Difference between disc brake and drum brake. (04 Marks)

OR

- 6 a. Explain the different safety measures taken in modern vehicles. (05 Marks)
- b. Explain with neat sketch steering linkage used in the vehicle with rigid axle front suspension. (08 Marks)
- c. Explain the followings: (i) Seat belt (ii) Air bags (07 Marks)

Module-4

- 7 a. Write the exhaust gas pollutants and their effects on environment. (07 Marks)
b. Explain with neat sketch Ethanol Engine Vehicles. (07 Marks)
c. Explain the types of bio-fuels. (06 Marks)

OR

- 8 a. Explain with a line diagram of refining of crude oil. (07 Marks)
b. Explain with neat sketch, CNG engine vehicles. (06 Marks)
c. Explain with neat sketch, Hydrogen Engine Vehicles. (07 Marks)

Module-5

- 9 a. Explain the following:
(i) Lead acid battery (14 Marks)
(ii) Lithium and metal air battery (06 Marks)
(iii) Nickel based battery
b. Explain the regenerative braking system in EV vehicles.

OR

- 10 a. What are the types of motors used in electrical vehicles? Explain the BLDC motor with neat sketch. (08 Marks)
b. Explain the necessity of battery cooling. (04 Marks)
c. Explain the type of electrical vehicles. (08 Marks)

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

21RMI56

Fifth Semester B.E. Degree Examination, June/July 2024

Research Methodology and Intellectual Property Rights

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Identify the meaning of Research and brief out the objectives and motivation in Engineering Research. (10 Marks)
b. Identify the steps to find the "Solve a worthwhile problem". (10 Marks)

OR

- 2 a. Identify the types of Engineering Research and briefly explain them. (10 Marks)
b. Identify the ethical issues related to authorship and brief out them. (10 Marks)

Module-2

- 3 a. Identify the essence of new and existing knowledge and explain briefly. (10 Marks)
b. Identify how search operators are used to narrow down the search results. (10 Marks)

OR

- 4 a. Identify the impacts of title and keywords on citation. (10 Marks)
b. Identify acknowledgement and attributions in research process and briefly explain. (10 Marks)

Module-3

- 5 a. Define Intellectual Property (IP). Explain the major types of IP. (10 Marks)
b. Identify the process of patenting. Briefly explain. (10 Marks)

OR

- 6 a. Explain briefly the Commercialization of a patent. (10 Marks)
b. What are the exclusions (product and processes) that cannot be patented? Explain. (10 Marks)

Module-4

- 7 a. Explain the classes or types of copyrights. (10 Marks)
b. What is a Trademark? Explain the symbols in TM. (10 Marks)

OR

- 8 a. What are the advantages "the registration of a trademark provides to the proprietor"? (10 Marks)
b. Identify process of Trademark registration and explain briefly the classification of TM. (10 Marks)

Module-5

- 9 a. Define Industrial design. Briefly explain acts and laws to govern Industrial design. (10 Marks)
b. Identify procedure for registration of Industrial design by taking example of Aple Inc Vs Samsung Electronics Co. (10 Marks)

OR

- 10 a. Define Geographical Identification (GI) and briefly explain acts, laws and rules pertaining to GI. (10 Marks)
b. Identify IP Organizations in INDIA. Explain schemes and programs for Intellectual Property Rights. (10 Marks)

* * * * *

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

CBCS SCHEME

21CIV57

USN

--	--	--	--	--	--	--	--	--	--

Question Paper Version : A

Fifth Semester B.E./B.Tech. Degree Examination, June/July 2024 Environmental Studies

Time: 1 hr.]

[Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

-
1. In an ecosystem, the flow of energy is _____.
a) Biodirectional b) Cyclic c) Unidirectional d) Multidirectional
 2. Which of the following is a biotic component of an ecosystem?
a) Fungi b) Solar light c) Temperature d) Humidity
 3. Which pyramid is always upright?
a) Energy b) Biomass c) Numbers d) Food chain
 4. The largest reservoir of nitrogen in our planet is,
a) Oceans b) Atmosphere c) Biosphere d) Fossil fuels
 5. Abiotic components include,
a) Soil b) Temperature c) Water d) All of these
 6. Primary consumer is,
a) Herbivores b) Carnivores c) Macro consumers d) Omnivores
 7. The word "Environment" is derived from _____.
a) Greek b) French c) Spanish d) English
 8. Mineral is,
a) Organic matter b) Naturally occurring inorganic substance
c) Synthesis compound d) None of these

9. The term ecosystem was first proposed by,
 a) Jacob Van Verkul b) A.G. Transley c) Costraza d) Marrie Gibbs
10. Gold occur in,
 a) Sedimentary Deposits b) Places deposits
 c) Hydrothermal deposits d) None of these
11. Fluorosis is caused due to,
 a) No fluoride intake b) Low fluoride intake
 c) Excessive fluoride intake d) None of these
12. Decrease of oxygen level in water mainly causes,
 a) Fluorosis b) Death of aquatic life
 c) Water pollution d) Both (b) and (c)
13. Mineral resource are,
 a) Renewable b) Non-Renewable c) Equally distributed d) None of these
14. Deforestation can,
 a) Increase the rainfall b) Increase Soil fertility
 c) Introduce silt in rivers d) None of these
15. Plants use _____ gas for photosynthesis.
 a) Oxygen b) Methane c) Nitrogen d) Carbon dioxide
16. Forests prevent soil erosion by binding soil particles in their,
 a) Stems b) Roots c) Leaves d) Buds
17. Nitrogen fixing bacteria exists in _____ of plants?
 a) Leaf b) Roots c) Steam d) Flower
18. Which of the following is the source of ground water?
 a) Oceans b) Springs c) Rivers d) All of these
19. The effluents from urban areas contain,
 a) Oil and greases b) Detergents
 c) Nutrients d) All of these
20. Maximum dissolved oxygen is required by,
 a) Fish b) Bacteria c) Vegetables d) All of these
21. Which of the following is not a component of soil?
 a) Mineral matter b) Organic matter c) Ozone d) Soil air
22. Definition of Noise is,
 a) Loud sound b) Unwanted sound c) Constant sound d) Sound of high frequency
23. The Noise is measured in,
 a) Decibels b) Joules c) PPM d) NTU

24. Noise pollution can be minimized by,
 a) Urbanization
 b) Maintaining silence
 c) Reducing noise at source
 d) None of these
25. Bursting crackers mainly causes,
 a) Noise pollution
 b) Plastic pollution
 c) Marine pollution
 d) None of these
26. Water pollution can be minimized by,
 a) Releasing sewage to ocean
 b) Releasing effluent to waste land
 c) Treating waste water
 d) None of these
27. Chlorine can be used to,
 a) To kill pathogenic microorganisms
 b) To increase the pH
 c) To clear the turbidity
 d) All of these
28. Carbon content is higher in,
 a) Soil
 b) Atmosphere
 c) Water
 d) Living matter
29. The depletion of trees is causing accumulation of _____.
 a) NO_3
 b) SO_2
 c) CO_2
 d) O_2
30. The adverse effect of modern agriculture is,
 a) Water pollution
 b) Soil degradation
 c) Water logging
 d) All of these
31. E.I.A is related to,
 a) Resource conservation
 b) Efficient Equipment process
 c) Waste minimization
 d) All of these
32. "Earth Day" is held every year on,
 a) June 5th
 b) November 23rd
 c) April 22nd
 d) January 26th
33. Which of the following is the most environmental friendly agriculture practice?
 a) Using chemical fertilizers
 b) Using insecticides
 c) Organic farming
 d) None of these
34. The diesel vehicles pollute the environmental largely through,
 a) NO_x
 b) CO
 c) Unburnt hydrocarbons
 d) All of these
35. Which among the following is clean fuel?
 a) Petrol
 b) Diesel
 c) Electricity
 d) CNG
36. Which among the following is not a greenhouse gas,?
 a) N_2O
 b) CFC's
 c) HFA's
 d) None of these
37. The protocol that reduces greenhouse gas emission's are,
 a) Kyoto protocol
 b) Cartagena protocol
 c) Montreal protocol
 d) Vienna protocol
38. Global Warming could affect,
 a) Climate
 b) Increase in Sea level
 c) Melting of glaciers
 d) All of these

39. Which of the following is a source of SO_2 in atmosphere?
a) Volcanoes
b) Thermal power plants
c) H_2SO_4 manufacturing
d) All of these
40. Atmospheric oxidation of SO_2 to SO_3 is influenced by,
a) Sunlight
b) Humidity
c) Presence of hydrocarbons
d) All of these
41. Acid Rain effects _____
a) Materials
b) Plants
c) Soil
d) All of these
42. Ozone layer is present in,
a) Troposphere
b) Stratosphere
c) Mesosphere
d) Thermosphere
43. Which of the following is the unit for measuring the thickness of ozone layer?
a) Decibels
b) Dobson unit
c) Centimeter
d) None of these
44. CFC's have been used as,
a) Solvents
b) Refrigerants
c) Blowing agents for polymer foams
d) All of these
45. Ozone hole was first discovered over,
a) Arctic
b) Antarctica
c) Tropical region
d) Africa
46. The term acid rain was coined in the year,
a) 1952
b) 1852
c) 1652
d) 1752
47. Which of the following is not a source of CO_2 in the atmosphere?
a) Burning of fossil fuels
b) Photosynthesis
c) Volcanic Eruptions
d) Animal and plant respiration and decay
48. Increase in Asthma attacks has been linked to high levels of,
a) Oxygen
b) Airborne dust particles
c) Nitrogen
d) All of these
49. Food chain is divided into _____ basic categories.
a) Four
b) Three
c) Five
d) Seven
50. About $\frac{3}{4}$ of the country's coal deposits are found in,
a) Karnataka
b) Tamil Nadu
c) Kashmir
d) Bihar and Orissa.
