Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) / S6 (PT) (R,S) Examination May 2024 (2019 Scheme)

Course Code: CET 308

Course name: COMPREHENSIVE COURSE WORK

Max. Marks: 50 Duration: 1Hour

Instructions: ***(1) Each question carries one mark. No negative marks for wrong answers***
(2) Total number of questions: 50
(3) All questions are to be answered. Each question will be followed by 4 possible answers of which only ONE is correct.
(4) If more than one option is chosen, it will not be considered for valuation.

1. The Elastic Modulus is the measure of

   a) Stiffness b) Hardness c) Tensile strength d) Shear strength

2. The unit of poisson's ratio is

   a) N/mm^2 b) Dimensionless c) MPa d) m/s^2

3. The area under the stress-strain up to the elastic limit is called

   a) Modulus of Rupture b) Modulus of toughness c) Modulus of Resilience d) toughness

4. A steel bar of length 20 m is exposed to a temperature variation from -15 °C to 40 °C. What will be its final length (coefficient of thermal expansion is 12×10^{-6} per °C)

   a) 21 m b) 20.0096 m c) 0.0132 m d) 20.0132 m

5. Given that the bulk modulus (K) of a material is 120 GPa and the Poisson's ratio is 0.4, calculate the modulus of elasticity (E) of the material.

   a) 72 GPa b) 48 GPa c) 24 Gpa d) 12 GPa

6. In case of pure bending beam attains the shape

   a) Parabola b) Arc of a circle c) Hyperbola d) ellipse

7. If the major and minor principal stresses in a plane stress problem are 90 MPa and 40 Mpa, the magnitude of maximum shear stress will be

   a) 65 MPa b) 45 MPa c) 25 MPa d) 20 MPa

8. The angle made by major principal plane with horizontal is 30°, what will be the angle made by minor principal plane with horizontal.

   a) 90° b) 15° c) 45° d) 60°

9. The graphical representation of normal and shear stress on various planes in a stress element is.

   a) Mohr's Circle b) Stress strain curve c) Plasticity chart d) PSD curve

10. The bending moment at the free end of a cantilever beam subject to uniformly distributed load w/m is

a) $wl^2/2$ b) zero c) $wl^2/4$ d) $wl^2/8$

11 Which of the following device is used to measure the velocity of liquid through a pipe

a) Barometer b) Thermometer c) Pitot tube d) hydrometer

12 if the distance between centre of buoyancy and metacentre is 10 m and centre of gravity and metacentre is 12 m what is the metacentric height.

a) 22 m b) 10 m c) 1 m d) -2 m

13 A spherical object weighs 19.62 kN in air and 9.81 in water what will be the volume of the object.

a) 1000 litres b) 9.81 m^3 c) 2m^3 d) 0.5 m^3

14 Flow in open channel is said to be subcritical if the ratio of the flow inertia to the external force field is

a) Equal to one b) Less than one c) Greater than one d) Greater than 2

15 The equation derived based on principle of conservation of mass is

a) Bernoulli's equation b) Pascal's Equation c) continuity equation d) Froud's equation

16 A pipeline carries 1.2 m^3/s of water with a velocity of 0.30 m/s. What will be the area of pipe.

a) 0.36 m^2 b) 3.6 m^2 c) 0.25 m^2 d) 4 m^2

17 If the velocity of flow through pipe is 19.62 m/s what will be the loss at exit of pipe

a) 19.62 m b) 2 m c) 1m d) 9.81 m

18 The most efficient section of a channel from among the given is

a) Square b) Trapezoidal c) Triangular d) Rectangular

19 Energy per unit weight of the fluid at a particular section considering the bottom of the bed as datum in open channel flow is

a) Work done b) Unit energy c) Specific energy d) Specific gravity

20 Jump or standing wave formed when the depth of flow of water changes from supercritical to subcritical state

a) Critical flow b) Jump wave c) Subcritical flow d) Hydraulic jump

21 Line joining the intersection of the cross-hairs to the optical centre of the objective and its continuation

a) Line of collimation b) Visual line c) Axis of vision d) Cross line

22 A set of closed contours with values increasing towards their centre, represent

a) Overhanging cliff b) Hill c) Pond d) Stepped well

23 If contour lines cross each other, it shows

a) River channel b) Hill c) overhanging cliffs or a cave d) Pond

24 The phenomenon due to which the direction of the magnetic needle deviates from the true magnetic north due to the various magnetic objects in the vicinity is called

a) Declination b) Dip c) Local error d) Local attraction

25 In surveying declination of 3° means

a) Magnetic north is 3° east of true north
b) The angle between horizontal and magnetic needle is 3°
c) Angle between true meridian and magnetic meridian is 6°
d) Angle between true meridian and magnetic meridian is 1.5°

26 A line of levels has been run from a benchmark of elevation +100.00 m and ends at another bench mark of elevation +102.00m. The sum of back sights is 19.80m and the sum of foresights is 18.00 m. The closing error of the survey work is

a) 1.80 m b) 0.2 m c) 2.00 m d) -1.80 m

27 A combination of an electronic theodolite, an electronic distance measurement is called

a) Tachometer b) Distomat c) Total station d) tachemetry

28 'GAGAN' Stands for

a) Geo augmented Global positioning system and navigation
b) Geographic information system for Indian terrain
c) GIS and GPS Augmented Navigation
d) GPS-Aided Geo Augmented Navigation

29 The process of detecting and monitoring the physical characteristics of an area by measuring its reflected and emitted radiation at a distance

a) Remote sensing b) Geographic information system c) Global positioning system d) Land surveying

30 Creating a network of interconnected triangles to accurately determine the positions of points on the Earth's surface

a) Digital elevation model b) Triangulation c) Digital triangle network d) GPS

31 The void ratio of a soil is given as 0.25 what will be the porosity

a) 4 b) 0.5 c) 0.2 d) 0.75

32 If the bulk unit weight is 20 kN/m^3 and water content is 25% what will be the dry unit weight?

a) 18 kN/m^3 b) 5 kN/m^3 c) 15 kN/m^3 d) 16 kN/m^3

33 Size of fine-grained soil will be less than

a) 0.075 mm b) 2 microns c) 4.75 mm d) 2 mm

34 The permeability of clay will be _____ silt

a) More than b) Less than c) Always more than d) Equal to

35 Among the following which one will not influence the permeability

a) Type of soil b) Degree of saturation c) Coefficient of consolidation d) Void ratio

36 For the determination of permeability non cohesive soil generally _____ permeability test is adopted.

a) Variable head b) Flexible wall c) Falling head d) Constant head

37 If the maximum, minimum and field void ratios are 0.6, 0.4 and 0.5 respectively, what will be the relative density?

a) 50 % b) 0.4 c) 0.6 d) 60 %

38 In a direct shear test the failure plane will be

a) vertical b) horizontal c) At 45° with horizontal d) A principal plane

39 In an unconfined compression test the maximum stress was recorded as 100 kN/m^2. What will be the undrained cohesion intercept.

a) 25 kN/m^2 b) 200 kN/m^2 c) 50 kN/m^2 d) 100 kN/m^2

40 A vane shear test is recommended in

a) Stiff clay b) Sand c) Saturated sand d) Soft clay

41 The specifications for ordinary portland cement, 33 grade in India is given in

a) IS 269-2013 b) IS 456-2000 c) IS 800-2007 d) IS 2720-1-1983

42 The major ingredient in cement is

a) Alkalies b) Lime c) Sulphur d) Aluminium

43 Which among the given is not a product of Cement Hydration Process

a) Ettringite b) Calcium Silicate Hydrate (C-S-H) Gel c) Hydrogen sulphide d) Calcium Hydroxide (CH)

44 The strength of concrete is _____ water cement ratio.

a) Independent of b) Proportional to c) Equal to d) Inversely related to

45 Commonly accepted ratio of mortar used for plastering is

a) 1:4 b) 1:8 c) 1:10 d) 1:12

46 A _____ contract in a building project protects owners against unforeseen changes and setbacks.

a) Cost plus b) Lump-sum c) Integrated Project Delivery d) Unit Price Contract

47 PERT method is used in

a) Budgeting b) Finalising c) Scheduling d) Cost estimation

48 The path in which float zero in a network diagram is called

a) Free float b) Total float c) Critical time d) Critical path

49 The amount of time a task can be delayed without affecting the completion date of the project

a) Total Float b) Free float c) Critical time d) Free time

50 Critical path method uses

a) Probabilistic Approach b) Deterministic approach c) Three-time estimate d) Slack