

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Sixth Semester B.Tech Degree Examination June 2022 (2019 Scheme)



Course Code: CET308

Course name: COMPREHENSIVE COURSE WORK

Max. Marks: 50

Duration: 1 Hour

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 shape of the bending moment diagram over the length of a beam, carrying a uniformly distributed load is always
 - a) linear
 - b) parabolic
 - c) cubical
 - d) circular
2. If the shear force along a section of a beam is zero, the bending moment at the section is
 - a) zero
 - b) maximum
 - c) minimum
 - d) average of maximum-minimum
3. For a given material Young's modulus is 200 GPa and modulus of rigidity is 80 GPa. The value of Poisson's ratio is
 - a) 0.15
 - b) 0.2
 - c) 0.3
 - d) 0.25
4. If the principal stresses in a plane stress problem are $\sigma_1 = 100\text{MPa}$ and $\sigma_2 = 40\text{Mpa}$, the magnitude of maximum shear stress will be
 - a) 60
 - b) 50
 - c) 40
 - d) 30
5. The angle between major principal plane and minor principal plane for a strained body is
 - a) 45
 - b) 30
 - c) 90
 - d) 60
6. The angle between principal plane and the plane of maximum shear is
 - a) 90
 - b) 125
 - c) 60
 - d) None of these
7. What is the stress developed in bending a 10mm diameter steel rod of $E = 200\text{GPa}$ to 2000mm diameter
 - a) 500MPa
 - b) 2000Mpa
 - c) 1000MPa
 - d) 900MPa
8. The bending stress in a beam varies directly with
 - a) Moment of inertia
 - b) Polar moment of inertia
 - c) Cross section of the beam
 - d) Distance from the neutral axis

9. In a simply supported beam maximum shear stress in a triangular cross section of altitude h occurs at a distance
- a) $h/3$ from the bottom of the beam b) $h/3$ from the top of the beam c) $h/6$ from the neutral axis d) $h/3$ from the top of the beam
10. Two beams of equal cross-sectional areas are subjected to equal bending moment. If one beam has square cross section and the other has a circular cross-section, then
- a) Both beams will be equally strong b) Circular section will be stronger c) Square section will be stronger d) the strength of the beam will depend on the nature of loading
11. A pitot tube is used to measure
- a) pressure b) difference in pressure c) velocity of flow d) none of these.
12. For exerting a pressure of 4.8 kg/cm^2 , the depth of oil (specific gravity 0.8), should be
- a) 40 cm b) 41 cm c) 56 cm d) 60 cm
13. The flow in open channel is said to be subcritical if the Froude number is
- a) less than 1.0 b) equal to 1.0 c) greater than 1.0 d) none.
14. In the stability of floating bodies, the stable equilibrium is attained if the meta centre M ---- the centre of gravity G .
- a) Lies above b) Coincides with c) Is parallel to d) Lies below
15. A vertical triangular plane area, submerged in water, with one side in free surface, vertex downward and altitude h has the pressure centre below the surface by
- a) $h/4$ b) $h/3$ c) $h/2$ d) $2h/3$
16. For incompressible fluid flow, if area reduces then what is the effect on the velocity
- a) increases b) decreases c) first increases then decreases d) first decreases then increases
17. The diameters of a pipe at the sections 1 and 2 are 8 cm and 13 cm respectively. Find the discharge through pipe if the velocity of water flowing through the pipe at section 1 is 6 m/s. Determine also the velocity at section 2.
- a) 2.27 m/s b) 4.54 m/s c) 1.13 m/s d) 3.25 m/s
18. Two pipe lines of equal length and diameters of 10 cm and 40 cm are connected in parallel between two reservoirs. If the friction factor f is same for both the pipes, the ratio of the discharges in the larger to the smaller pipe is
- a) 4 b) 16 c) 32 d) 64
19. Sudden and turbulent passage of water from a super critical state to sub critical state is known as
- a) Hydraulic gradient b) Hydraulic jump c) Hydraulic mean radius d) Hydraulic depth
20. Specific energy of a flowing fluid per unit weight is equal to
- a) $P/w + v^2/2g$ b) $P/w + h$ c) $h + v^2/2g$ d) $P/w + v^2/2g + h$
21. An ideal vertical curve to join two gradients, is
- a) circular b) parabolic c) elliptical d) hyperbolic

- 22 The real image of an object formed by the objective, must lie
 a) in the plane of cross hairs b) at the centre of the telescope c) at the optical centre of the eye-piece d) nywhere inside the telescope.
- 23 Closed contours of decreasing values towards their centre, represent
 a) a hill b) a depression c) a saddle or pass d) a river bed
- 24 ----- is a term used that prevents the needle from pointing to the magnetic north in a given locality
 a) Local attraction b) declination c) deviation d) Local distraction
- 25 The line drawn through the points of same declination
 a) Polygonic a) Isogonic a) syngonic a) Agonic
- 26 A line of levels has been run from a benchmark of elevation +125.42m and ends at another bench mark of elevation +125.45m. The sum of back sights is 17.58m and the sum of foresights is 17.61m. The closing error of the survey work is
 a) -0.06m a) 0.03m a) -0.03m a) 0.06m
- 27 A relatively fixed point of known elevation above the datum is called
 a) Bench mark b) Datum point c) Reduced level d) Reference point
- 28 A total station is a combination of
 a) EDM and Theodolite b) Compass and EDM c) Electronic Theodolite and EDM d) EDM and Electronic compass
- 29 Which of the following indicates the principle of GPS
 a) Resection b) Trilateration c) Trisection d) Traversing
- 30 The minimum number of satellites needed for a GPS to determine its position precisely
 a) 2 b) 3 c) 4 d) 24
- 31 In a liquid limit test, the moisture content at 10 blows was 70% and that at 100 blows was 20%. The liquid limit of the soil, is
 a) 35% b) 50% c) 65% d) none of these
- 32 When drainage is permitted, under initially applied normal stress only and full primary consolidation is allowed to take place, the test is known as
 a) quick test b) drained test c) consolidated undrained test d) none of these.
- 33 A compacted soil sample using 10% moisture content has a weight of 200 g and mass unit weight of 2.0 g/cm³. If the specific gravity of soil particles and water are 2.7 and 1.0, the degree of saturation of the soil is
 a) 11.1% b) 55.6% c) 69.6% d) none of these.
- 34 The coefficient of curvature is defined
 a) $\frac{D_{60}}{D_{10}}$ b) $\frac{D_{10}}{D_{60}}$ c) $\frac{D_{30}^2}{D_{60}D_{10}}$ d) $\frac{D_{10}^2}{D_{30}D_{60}}$
- 35 The liquid limit and plastic limit exist in
 a) sandy soils b) silty soils c) gravel soils d) clay soils

- 36 The ratio of settlement at any time 't' to the final settlement, is known as
 a) co-efficient of consolidation b) degree of consolidation c) consolidation index d) consolidation of undisturbed soil.
- 37 Fundamental relationship between dry density (γ), specific gravity (G), water content (ω) and percentage of air voids (n_a) is :
 a) $\frac{(1 - n_a)G \gamma \omega}{1 + \omega G}$ b) $\frac{(1 + n_a)G \gamma \omega}{1 + \omega G}$ c) $\frac{(1 + n_a)G \gamma \omega}{1 - \omega G}$ d) $\frac{(1 - n_a)G \gamma \omega}{1 - \omega G}$
- 38 If the coefficient of the active pressure K_a is $1/3$, the coefficient of passive pressure K_p , is
 a) $1/3$ b) $2/3$ c) 1 d) 3
- 39 A cylinder of clayey soil fails under axial vertical stress of 20 t/m^2 when it is laterally unconfined. The failure plane makes an angle of 45° with the horizontal. The cohesion of soil sample will be
 a) 10 t/m^2 b) 20 t/m^2 c) 14.14 t/m^2 d) 28.28 t/m^2
- 40 Field test for determining shear strength of soil is
 a) Vane shear test b) Direct shear test c) Triaxial shear test d) UCS test
- 41 Separation of coarse aggregates from mortar during transportation, is known
 a) bleeding b) creeping c) segregation d) shrinkage
- 42 Workability of concrete for a given water content is good if the aggregates, are
 a) rounded aggregate b) irregular aggregate c) angular aggregate d) flaky aggregates.
- 43 Efflorescence in cement is caused due to an excess of
 a) alumina b) iron oxide c) silica d) alkalis
- 44 Sands of zone I are
 a) coarse b) medium c) medium to fine d) fine.
- 45 Di-calcium silicate (C2S)
 a) hydrates rapidly b) generates less heat of hydration c) hardens rapidly d) provides less ultimate strength to cement
- 46 Bulking of sand is
 a) mixing of different sizes of sand particles b) mixing of lime with sand c) maximum water with sand d) swelling of sand when wetted.
- 47 Pessimistic and optimistic time for completing an activity are given as 10 days and 4 days respectively, the variance of the activity will be
 a) 1 b) 6 c) 12 d) 18
- 48 The time by which an activity completion time can be delayed without affecting the start of the succeeding activities is known as
 a) Duration b) Total float c) Free float d) Interfering float
- 49 When an offer with certain terms and conditions is given in written form it is call as _____.
 a) Tender b) Contract c) Agreement d) Notice
- 50 The development of first 28 days strength is on account of the hydration of
 a) C_2S b) C_3S c) C_3A d) C_4AF
