

POST GRADUATE COMMON ENTRANCE TEST-2016

DATE and TIME	COURSE	SUBJECT
03-07-2016 2.30 p.m. to 4.30 p.m.	ME/M.Tech/M.Arch/ courses offered by VTU/UVCE/UBDTCE	CIVIL ENGINEERING
MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
100	150 Minutes	120 Minutes
MENTION YOUR PGCET NO.		QUESTION BOOKLET DETAILS
		VERSION CODE
		SERIAL NUMBER
		A - 1
		202289

DOs :

1. Check whether the PGCET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. Ensure whether the circles corresponding to course and the specific branch have been shaded on the OMR answer sheet.
3. This Question Booklet is issued to you by the invigilator after the 2nd Bell i.e., after 2.25 p.m.
4. The Serial Number of this question booklet should be entered and the respective circles should also be shaded completely on the OMR answer sheet.
5. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely on the OMR answer sheet.
6. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'Ts :

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. **The 3rd Bell rings at 2.30 p.m., till then;**
 - Do not remove the paper seal / polythene bag of this question booklet.
 - Do not look inside this question booklet.
 - Do not start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains 75 (items) questions and each question will have one statement and four answers. (Four different options / responses.)
2. After the 3rd Bell is rung at 2.30 p.m., remove the paper seal / polythene bag of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
3. During the subsequent 120 minutes:
 - Read each question (item) carefully.
 - Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **only one response** for each item.
 - **Completely darken / shade the relevant circle with a BLUE OR BLACK INK BALL POINT PEN against the question number on the OMR answer sheet.**

Correct Method of shading the circle on the OMR answer sheet is as shown below :



4. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
5. After the last Bell is rung at 4.30 pm, stop marking on the OMR answer sheet and affix your left hand thumb impression on the OMR answer sheet as per the instructions.
6. Handover the OMR ANSWER SHEET to the room invigilator as it is.
7. After separating the top sheet (KEA copy), the invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
8. Preserve the replica of the OMR answer sheet for a minimum period of ONE year.
9. Only Non-programmable calculators are allowed.

Marks Distribution	
PART-1	: 50 QUESTIONS CARRY ONE MARK EACH (1 TO 50)
PART-2	: 25 QUESTIONS CARRY TWO MARKS EACH (51 TO 75)

CE-A1



POST GRADUATE COURSE REGISTRATION LIST

NAME	ADDRESS	SECTION
JOHN J. ...	1234
MARY ...	5678
...
...
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The following information is provided for your reference. All information is subject to change without notice. Please contact the Registrar's Office for more information.

For more information, please contact the Registrar's Office at (555) 123-4567 or visit our website at www.university.edu/registrar.

REGISTRATION INFORMATION

Registration for the course is required by the deadline. Late registration may be accepted on a case-by-case basis.

Students must meet the prerequisites for the course. Prerequisites are listed in the course syllabus.

For a complete list of prerequisites, please refer to the course catalog.

Students should consult with their advisor for more information regarding course selection.

Additional information regarding the course can be found in the course syllabus.

Thank you for your interest in the course.

CIVIL ENGINEERING

PART - 1

Each question carries one mark.

(50 × 1 = 50)

1. The principle of super position is applicable when
 - (A) Deflections are linear functions of applied forces
 - (B) Material obeys Hooke's law
 - (C) Affected by small deformations
 - (D) None of the above
2. Chemically, marble is known as
 - (A) Sedimentary rock
 - (B) Metamorphic rock
 - (C) Calcareous rock
 - (D) Silicious rock
3. The minimum force required to slide a body of weight W on a rough horizontal plane is (where θ is an angle of internal friction.)
 - (A) $W \sin \theta$
 - (B) $W \cos \theta$
 - (C) $W \tan \theta$
 - (D) None of the above
4. The portion of the brick cut across the width is called as
 - (A) Closer
 - (B) Half brick
 - (C) Bed
 - (D) Bat
5. If the Young's modulus of a material is twice the modulus of rigidity, the Poisson's ratio of the material is
 - (A) - 1
 - (B) - 0.5
 - (C) 0.5
 - (D) Zero
6. Rate of change of shear force is equal to
 - (A) Shear force
 - (B) Deflection
 - (C) Slope
 - (D) Rate of loading

Space For Rough Work

7. When a first class brick is immersed in cold water for 24 hours, it should not absorb water by weight more than
- (A) 10%
 - (B) 15%
 - (C) 20%
 - (D) 25%
8. Maximum grade of concrete recommended for RCC by IS 456-2000 for moderate exposure is
- (A) M15
 - (B) M20
 - (C) M25
 - (D) M30
9. Size of the fine aggregate should not exceed _____ mm.
- (A) 2
 - (B) 3
 - (C) 3.75
 - (D) 4.75
10. Wall constructed with stones to protect the slopes of cutting in natural ground from the action of weathering agents is called
- (A) Retaining wall
 - (B) Breast wall
 - (C) Butress
 - (D) Parapet wall
11. Relation between strength of concrete (S) in kg/cm^2 and gel space (x) is given by
- (A) $S = 600x$
 - (B) $S = 1200x^2$
 - (C) $S = 2400x^3$
 - (D) None of these
12. The correction for sag in surveying
- (A) always additive
 - (B) always subtractive
 - (C) always zero
 - (D) sometimes additive and sometimes subtractive

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13. The curvature of the earth is taken into consideration if the limit of survey is
- (A) 50 to 100 km²
 - (B) 100 to 200 km²
 - (C) 200 to 250 km²
 - (D) More than 250 km²
14. A series of closely spaced contour lines represents
- (A) Steep slope
 - (B) Gentle slope
 - (C) Uniform slope
 - (D) Plane surface
15. If the fore bearing of a line is 36° 15', its back bearing will be
- (A) 36° 15'
 - (B) 120° 15'
 - (C) 140° 45'
 - (D) 216° 15'
16. The difference in length between the arc and the subtended chord on the surface of the earth for a distance of 18.2 km is only
- (A) 10 mm
 - (B) 30 mm
 - (C) 50 mm
 - (D) 100 mm
17. In series pipe problems
- (A) The head loss is same through each pipe.
 - (B) The discharge is same through each pipe
 - (C) A trial solution is not necessary
 - (D) None of these.
18. The centre of buoyancy always
- (A) coincides with centre of gravity.
 - (B) coincides with centroid of the volume of fluid displaced.
 - (C) remains above the centre of gravity.
 - (D) remains below the centre of gravity.

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19. The loss of head at entrance in the pipe is
- (A) $V^2/2g$
 - (B) $0.5 V^2/2g$
 - (C) $0.37 V^2/2g$
 - (D) $0.75 V^2/2g$
20. The Eddy viscosity for turbulent flow is
- (A) A function of temperature only.
 - (B) A physical property of the fluid.
 - (C) Dependent on the flow.
 - (D) Independent of the flow.
21. When the metacentre of a floating body is lower than the centre of gravity, then the body will be in
- (A) Unstable equilibrium
 - (B) Stable equilibrium
 - (C) Neutral equilibrium
 - (D) None are correct
22. A propped cantilever of span 'l' carries a uniformly distributed load of 'w' per unit run over its entire span. The value of prop reaction to keep the beam horizontal is
- (A) $wl/3$
 - (B) $3wl/8$
 - (C) $wl/2$
 - (D) $5wl/8$
23. The maximum value of Poisson's ratio is
- (A) 0.30
 - (B) 0.40
 - (C) 0.50
 - (D) 0.60
24. What is the minimum percentage of main reinforcement in RCC beam for Fe-415 grade steel ?
- (A) 0.20
 - (B) 0.30
 - (C) 0.40
 - (D) 0.50

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25. According to Indian standards the grading of fine aggregates is divided into
- (A) 2 zones
 - (B) 3 zones
 - (C) 4 zones
 - (D) 5 zones
26. The effective length of a chimney of 20m height is taken as
- (A) 10 m
 - (B) 20 m
 - (C) 28.28 m
 - (D) 40 m
27. The basic perfect frame is a
- (A) Triangle
 - (B) Rectangle
 - (C) Square
 - (D) Hexagon
28. A RCC beam is tested in the laboratory, the first crack in the bending zone represents
- (A) Modulus of elasticity
 - (B) Modulus of rigidity
 - (C) Bulk modulus
 - (D) Modulus of rupture
29. Modulus of elasticity of M20 grade concrete is
- (A) 25491 MPa
 - (B) 20491 MPa
 - (C) 30491 MPa
 - (D) 15491MPa
30. A beam of rectangular cross section is 100mm wide and 200mm deep. If the section is subjected to a shear force of 20kN, then the maximum shear stress in the section is
- (A) 1 MPa
 - (B) 1.125 MPa
 - (C) 1.33 MPa
 - (D) 1.5 MPa

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31. The shear stress at the neutral axis in a beam of triangular section with a base of 40 mm and height of 20 mm subjected to a shear force of 3kN is
- (A) 3 MPa
 - (B) 6 MPa
 - (C) 10 MPa
 - (D) 20 MPa
32. In a reinforced concrete beam, the shear stress distribution above the neutral axis follows a
- (A) Straight line
 - (B) Circular curve
 - (C) Parabolic curve
 - (D) All of these.
33. Which of the following does not fall in the category of displacement method ?
- (A) Method of consistence deformation
 - (B) Equilibrium method
 - (C) Moment distribution method
 - (D) Stiffness method.
34. The densification of soil by machine is called
- (A) Consolidation
 - (B) Compression
 - (C) Compaction
 - (D) Soil stabilization
35. For a stable packing of regular spheres at the maximum density, the void ratio is
- (A) 0.91
 - (B) 0.81
 - (C) 0.65
 - (D) 0.34
36. Along a phreatic line in an earth dam
- (A) the total head is constant in an earth dam.
 - (B) the total head is everywhere zero.
 - (C) the pressure head is everywhere zero.
 - (D) None of these.

Space For Rough Work

37. The purpose of balancing reservoir in a water supply distribution system is
- (A) equalize pressure in the distribution system.
 - (B) store adequate quantity of water to meet requirement in case of breakdown of inflow.
 - (C) store adequate fire fighting reservoir.
 - (D) take care of fluctuations in the rate of consumption.
38. The formula $P_n = P + nd$, is used for predicting population by
- (A) Arithmetical increase method.
 - (B) Incremental increase method.
 - (C) Geometrical increase method.
 - (D) Rational method.
39. Standard EDTA solution is used to determine
- (A) Hardness in water.
 - (B) Turbidity in water.
 - (C) Dissolved oxygen in water.
 - (D) Residual chloride in water.
40. The minimum dissolved oxygen required in water to save the aquatic life is
- (A) 1 ppm
 - (B) 2 ppm
 - (C) 4 ppm
 - (D) 8 ppm
41. If the diameter of the main pipe is taken less than the economic diameter, then
- (A) Head loss will be high
 - (B) Cost of pipe will be less
 - (C) Both of (A) and (B)
 - (D) None of the above
42. The portion of a road surface, which is used by vehicular traffic, is known as
- (A) Carriage way
 - (B) Shoulder
 - (C) Express way
 - (D) All of these
43. The side slope of embankment for a railway track is taken as
- (A) 1:1
 - (B) 1.5:1
 - (C) 2:1
 - (D) 2.5:1

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44. The highest point on the road surface is called
- (A) Crown
 - (B) Camber
 - (C) Gradient
 - (D) Berm
45. Which test is performed for quick determination of quality of subgrade soil ?
- (A) CBR
 - (B) Stripping
 - (C) Thread
 - (D) None of these
46. The super elevation is
- (A) directly proportional to the velocity of the vehicles.
 - (B) inversely proportional to the velocity of vehicles.
 - (C) directly proportional to the width of the pavement.
 - (D) inversely proportional to the width of the pavement.
47. The performance of a well is measured by its
- (A) Seepage capacity
 - (B) Specific yield
 - (C) Storage coefficient
 - (D) None of these
48. A perched aquifer is essentially found within
- (A) Unconfined aquifer
 - (B) A confined aquifer
 - (C) An acquiclude
 - (D) None of these
49. Average delta of rice crop is nearly
- (A) 30 cm
 - (B) 60 cm
 - (C) 120 cm
 - (D) 150 cm
50. If electrical conductivity of water is in between 250 to 750 mho's/cm at 25 °C, then it is classified as
- (A) Low salinity
 - (B) Medium salinity
 - (C) High salinity
 - (D) Very high salinity

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PART - 2

(Each question carries two marks)

(25 × 2 = 50)

51. The horizontal shear acted on an element induces vertical shear is because of
- (A) horizontal force is in equilibrium
 - (B) horizontal and vertical force is in equilibrium
 - (C) horizontal and vertical forces is in equilibrium along with moment equilibrium
 - (D) only moment equilibrium
52. For a given material bulk modulus is 140 kN/m^2 and modulus of rigidity is 80 kN/m^2 . The value of Poisson's ratio is
- (A) 0.2
 - (B) 0.26
 - (C) 0.25
 - (D) 0.33
53. A rigid bar fixed at both ends is heated from normal temperature to 10°C higher, then what kind of stress is induced in the material of the bar ?
- (A) Bending stresses
 - (B) Shear stresses
 - (C) Compressive stresses
 - (D) Tensile stresses
54. If the RL of the bench mark is 100.00 m the back sight is 1.215 m and fore sight is 1.870 m, the RL of the forward station is
- (A) 99.345 m
 - (B) 100.345 m
 - (C) 100.655 m
 - (D) 101.870 m
55. The main plate of a transit is divided into 1080 equal divisions. 60 divisions of the vernier coincide exactly with 59 divisions of the main plate. The transit can read angles accurate upto
- (A) 5"
 - (B) 10"
 - (C) 15"
 - (D) 20"
56. A slab of wood $4 \text{ m} \times 4 \text{ m} \times 1 \text{ m}$, specific gravity 0.50 floats in water with 400 kg mass on it. The volume of the slab submerged in cubic meters is
- (A) 1.6
 - (B) 6.4
 - (C) 8.4
 - (D) 10.0

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57. Two pipes of same length and diameters d and $2d$ respectively are connected in series. The diameter of an equivalent pipe of same length is
- (A) Less than d
 - (B) Between d and $1.5d$
 - (C) Between $1.5d$ and $2d$
 - (D) Greater than $2d$
58. If the friction factor of the laminar flow through a circular pipe is 0.1 . Then the Reynold's number of the flow will be
- (A) 2000
 - (B) 320
 - (C) 640
 - (D) 64
59. If the resultant of two forces has the same magnitude as either of the force, then the angle between the two forces is
- (A) 30°
 - (B) 45°
 - (C) 60°
 - (D) 120°
60. If the deflection at the free end of a uniformly loaded cantilever beam is 15 mm and the slope of the deflection curve at the free end is 0.02 radian then the length of the beam is
- (A) 0.8 m
 - (B) 1.0 m
 - (C) 1.2 m
 - (D) 1.5 m
61. If the depth of a simply supported beam is doubled and width made half, then the deflection of the beam decreases by a factor
- (A) 2
 - (B) 4
 - (C) 6
 - (D) 8

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62. A simply supported beam having point load P at $1/3$ span and uniform flexural rigidity. The deflection under the point load is
- (A) $\frac{PL^3}{243 EI}$
- (B) $\frac{2PL^3}{243 EI}$
- (C) $\frac{3PL^3}{243 EI}$
- (D) $\frac{4PL^3}{243 EI}$
63. Two ISMC 400 channels placed back to back at a spacing of 26 cm carry an axial load of 1600 kN, the lacing system should be designed to resist transverse shear of
- (A) 16 kN
- (B) 40 kN
- (C) 80 kN
- (D) 160 kN
64. Mohr's circle for the state of stress defined by $\begin{bmatrix} 30 & 0 \\ 0 & 30 \end{bmatrix}$ MPa is a circle with
- (A) Centre at (0, 0) and radius 30 MPa
- (B) Centre at (0, 0) and radius 60 MPa
- (C) Centre at (30, 0) and radius 30 MPa
- (D) Centre at (30, 0) and radius zero
65. When both ends of a column are fixed, the crippling load is P . If one end of the column is made free, the value of crippling load will be changed to
- (A) $P/16$
- (B) $P/4$
- (C) $P/2$
- (D) $4P$
66. In the stress-strain curve of concrete, the area of the stress block according to IS:456:2000
- (A) $0.36f_{ck}bX_u$
- (B) $0.42f_{ck}bX_u$
- (C) $0.20f_{ck}bX_u$
- (D) $0.30f_{ck}bX_u$

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67. The total passive earth pressure per metre length against a retaining wall of height 3Mt. with a backfill of soil having unit weight 1.8kN/m^3 & angle of internal friction of 30° will be

- (A) 21.2 kN/m
- (B) 22.8 kN/m
- (C) 24.3 kN/m
- (D) 26.5 kN/m

68. A braced cut, 5Mt. wide and 7.5 Mt. deep is prepared in a soil deposit having effective cohesion $C' = 0$ and effective friction angle $\Phi' = 36^\circ$. The first row of struts is to be installed at a depth of 0.5 Mt. below ground surface and spacing between the struts should be 1.5 Mt. If horizontal spacing of struts is 3 Mt. and unit weight of the deposit is 20kN/m^3 , the maximum strut load will be

- (A) 70.87 kN
- (B) 98.72 kN
- (C) 113.90 kN
- (D) 151.86 kN

69. In a typical deposit of submerged soil the approximate depth at which inter granular pressure is equal to 50 kN/m^2 is

- (A) 2.5Mt.
- (B) 5Mt.
- (C) 7.5Mt.
- (D) 10Mt.

70. A city supply of 1500 m^3 of water per day is treated with a chlorine dosage of 0.5 ppm. For this purpose, requirement of 25% bleaching powder per day would be

- (A) 300 kg
- (B) 75 kg
- (C) 30 kg
- (D) 7.5 kg

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71. If overflow rate of a continuous flow type rectangular sedimentation tank is kept at $400\text{lt}/\text{m}^2/\text{hr}$ with at plan area of 80Sq.Mt. and detention period of 2 Hrs, then the effective depth of the tank will be
- (A) 1.8 m
 - (B) 1.0 m
 - (C) 0.8 m
 - (D) 1.2 m
72. A district road with a bituminous pavement has a horizontal curve of 1000 Mts. for a design speed of 75 KMPH. The super elevation is
- (A) 1:40
 - (B) 1:60
 - (C) 1:50
 - (D) None of these
73. Overtaking time required, for a vehicle with a design speed of 50KMPH and overtaking acceleration of $1.25\text{m}/\text{sec}^2$ to overtake a vehicle moving at a speed of 30 KMPH is
- (A) 5 sec
 - (B) 225.48 sec
 - (C) 6.12 sec
 - (D) 30 sec
74. A basin area is served by four rain gauges with Thiessen weight of 0.1, 0.4, 0.4 and 0.1 respectively. If the rainfall recorded at these stations are 4, 2, 2 and 4 cm respectively, then the average depth of rainfall over the basin will be
- (A) 4 cm
 - (B) 2 cm
 - (C) 2.4 cm
 - (D) 3.66 cm
75. If a base period for a particular crop is 50 days and duty of the canal is 500 hectares per cumec, then depth of water will be
- (A) 0.864 cm
 - (B) 8.64 cm
 - (C) 86.4 cm
 - (D) 864 cm

Space For Rough Work

Space For Rough Work



The first part of the report is a summary of the work done during the past year. It covers the general progress of the project and the results of the various experiments. The second part is a detailed description of the apparatus used in the experiments. This includes a list of the materials and components used, and a description of the construction of the apparatus. The third part is a description of the methods used in the experiments. This includes a description of the procedures used to collect the data, and a description of the methods used to analyze the data. The fourth part is a discussion of the results of the experiments. This includes a comparison of the results with the theoretical predictions, and a discussion of the factors that may have influenced the results. The fifth part is a conclusion and a list of references.

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