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**Reprint: 2023**

# PREFACE



**B. Singh** (Ex. IES)

For each and every aspirant in the preparation for any competitive exam, consolidating what is learnt and to get the flavour & feel of actual exam are among the top in list of desiderata. With the students' expression of interest for a book to prepare effectively for State Level exams, this objective book is debut of MADE EASY in exclusive State Level Services study material which will definitely fulfil all the requirements of aspirants.

This book covers around 2500+ questions from various papers of 11 different PSCs across the country (namely APPSC, BPSC, RPSC, OPSC, MPSC, MPPSC, KPSC, HPPSC, TNPSC, UKPSC and Kerala PSC); book will certainly be a path for students to achieve their goal.

Reasonable efforts are been taken to make sure that answers are framed and transcribed accurately. With key formulae, relevant theory and graphical/pictorial representations this book will not only give questions of various PSCs over the years but also will equip students with concepts, knowledge and understanding of the subject. This book is not only for State Services exams but also it is equally beneficial for the preparation of various other competitive exams like ESE, GATE, PSUs exam etc.

It is impossible to acknowledge all the individuals who helped us, but would like to sincerely thank all authors, editors and reviewers for putting their painstaking efforts to publish this book.

**B. Singh** (Ex. IES)

Chairman and Managing Director  
MADE EASY Group

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**APPSC  
2016**

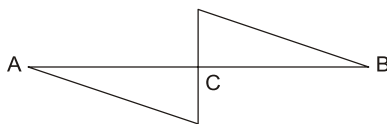
# Andhra Pradesh Public Service Commission

Exam held in 2016

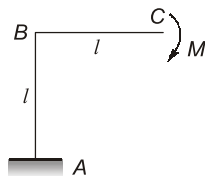
Mains

- Q.1** As per Indian standard code 1077, the burnt clay building bricks having compressive strength less than \_\_\_\_\_ N/mm<sup>2</sup> are known as common burnt clay bricks  
(a) 3.5 (b) 12.5  
(c) 30 (d) 40
- Q.2** After 24 hours immersion in cold water, water absorption by weight shall not exceed \_\_\_\_\_ percent of the dry weight of the brick.  
(a) 40 (b) 20  
(c) 25 (d) 30
- Q.3** Maximum slenderness ratio allowed as per Indian standard for an unreinforced load bearing wall (using Portland Cement or Portland Pozzolana Cement in mortar) is  
(a) 13 (b) 20  
(c) 27 (d) 35
- Q.4** The test conducted for the calculation of basic compressive stress of masonry is:  
(a) Vibration test (b) Prism test  
(c) CBR test (d) Slump cone test
- Q.5** Efflorescence test is conducted for burnt clay bricks to find out the  
(a) presence of alkaline substance  
(b) hardness  
(c) soundness  
(d) presence of cracks or holes
- Q.6** The apparatus used for determining the Soundness of cement is  
(a) Slump cone  
(b) Le Chatelier apparatus  
(c) Vicat's needle  
(d) UTM
- Q.7** Cement used for railway sleepers is designated as  
(a) 40-S (b) 53-S  
(c) 46-S (d) 48-S
- Q.8** The main constituent of cement which is responsible for initial setting of cement is  
(a) Dicalcium silicate  
(b) Tricalcium silicate  
(c) Tricalcium aluminate  
(d) None of the given answers
- Q.9** For testing compressive strength of hydraulic cement other than masonry cement as per IS 4031 - Part 6, the size of cube used is  
(a) 150 mm (b) 100 mm  
(c) 70.6 mm (d) 50 mm
- Q.10** Plywood has the advantage of  
(a) Greater tensile strength in longer direction  
(b) Greater tensile strength in shorter direction  
(c) Same tensile strength in both directions  
(d) None of the given answers
- Q.11** A queen closer is  
(a) Full brick  
(b) Longitudinally  $\frac{1}{2}$  brick  
(c)  $\frac{3}{4}$  brick  
(d)  $\frac{1}{2}$  brick
- Q.12** The artificial seasoning method that causes timber to become brittle and easy to break is  
(a) Boiling  
(b) Chemical seasoning  
(c) Electrical seasoning  
(d) Kiln seasoning

- Q.13** The age of tree can be known by examining  
 (a) Cambium layer (b) Annular rings  
 (c) Medullary rays (d) Heart wood
- Q.14** Inadequate compaction during concrete casting results in  
 (a) Honey combing  
 (b) Bleeding  
 (c) Segregation  
 (d) Bleeding and Segregation
- Q.15** If characteristic compressive strength at 28 days is 40 N/mm<sup>2</sup> and the standard deviation is 5 N/mm<sup>2</sup>, the target strength at 28 days for concrete mix proportioning  
 (a) 40 N/mm<sup>2</sup> (b) 45 N/mm<sup>2</sup>  
 (c) 43.25 N/mm<sup>2</sup> (d) 48.25 N/mm<sup>2</sup>
- Q.16** A statistically indeterminate structure is the one which  
 (a) cannot be analysed using equations of statics alone  
 (b) cannot be analysed at all  
 (c) is not stable for general loading  
 (d) can be analysed with the equations of statics along
- Q.17** If the BMD for a simply supported beam is as shown below, the load on the beam will be



- (a) a concentrated load at C  
 (b) equal and opposite couples at the ends A and B  
 (c) a uniformly distributed load acting on the entire span  
 (d) concentrated couple at C
- Q.18** The ratio of maximum deflection to maximum flexural stress in a simply supported beam of span  $l$  and depth  $d$  subjected to a concentrated load at mid-span is



(a)  $\frac{l^2}{(6Ed)}$  (b)  $\frac{l^2}{(8Ed)}$

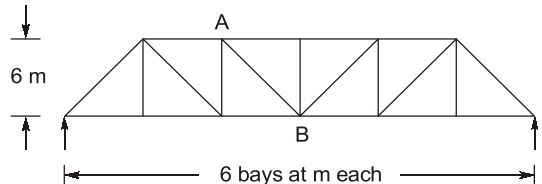
(c)  $\frac{l^2}{(16Ed)}$  (d)  $\frac{l^2}{(60Ed)}$

- Q.19** The horizontal deflection at C for the frame loaded and supported as shown below is ( $EI$  is constant)  
 (a)  $\frac{Ml^2}{(4EI)}$  (b)  $\frac{Ml^2}{(2EI)}$   
 (c)  $\frac{Ml^2}{(3EI)}$  (d)  $\frac{2Ml^2}{(EI)}$
- Q.20** The influence line for deflection at the free end of a cantilever is  
 (a) a triangle with zero ordinate at fixed end and maximum ordinate at free end  
 (b) a constant line  
 (c) a cubic parabola with zero ordinate at fixed end and maximum ordinate at free end  
 (d) a parabola with zero ordinate at fixed end and maximum ordinate at free end

- Q.21** A prismatic beam simply supported carries a concentrated load  $W$  at mid-span. If the same beam is fixed at its ends, what load at mid-span can produce the same deflection at mid-span?  
 (a)  $4W$  (b)  $2W$   
 (c)  $3W$  (d)  $5W$

- Q.22** Two concentrated loads of 50 kN each spaced at 4 m cross a simply supported girder of span 8 m. The absolute maximum bending moment in the girder is  
 (a) 1125 kN-m at 3 m from support  
 (b) 113.5 kN-m at 3 m from support  
 (c) 11.25 kN-m at 3 m from support  
 (d) 93.75 kN-m at 3 m from support

- Q.23** Influence line for member force in AB of the truss shown is obtained by

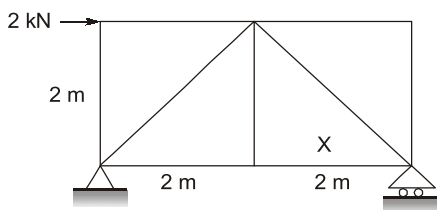


- (a)  $\sqrt{2}$  times the ordinates of influence line for bending moment at A  
 (b)  $\sqrt{2}$  times the ordinates of influence line for shear in 3<sup>rd</sup> panel from left  
 (c)  $\sqrt{2}$  times the ordinates of influence line for bending moment at B  
 (d)  $s\sqrt{2}$  times the ordinates of influence line for shear in 3<sup>rd</sup> panel from right

- Q.24** A parabolic arched rib, of span 30 m, is hinged at the springing and crown and is having a central rise of 5 m. If the coefficient of thermal expansion for the arch material is  $12 \times 10^{-6}$  per  $^{\circ}\text{C}$ , the effect of a temperature rise of  $300^{\circ}\text{C}$  is  
 (a) to cause thermal stresses  
 (b) to cause thermal stresses as well as a central rise of 18 mm  
 (c) to cause a central rise of 18 mm  
 (d) to cause no effect on the structure

- Q.25** A temperature rise in a two hinged symmetric and parabolic arched rib causes  
 (a) a uniform bending moment in the rib  
 (b) no bending moment in the rib  
 (c) a maximum bending moment at the crown of the arch  
 (d) a minimum bending moment at the crown of the arch

- Q.26** The force in the member 'X' of the truss supported and loaded as shown is

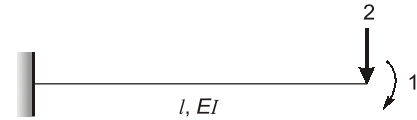


- (a)  $\sqrt{2}$  kN, Tension  
 (b)  $\sqrt{2}$  kN, Compression  
 (c) 1 kN, Tension  
 (d) 1 kN, Compression

- Q.27** A three-span continuous beam is fixed at the ends and supported by unyielding roller supports in between. What is the size of the stiffness matrix?  
 (a)  $2 \times 2$  (b)  $3 \times 3$   
 (c)  $1 \times 1$  (d)  $4 \times 4$

- Q.28** Which of the following is displacement method?  
 (a) Flexibility method  
 (b) Moment distribution method  
 (c) Kani's method  
 (d) None of the given answers

- Q.29** For the structure shown, the elements of the flexibility matrix are



(a)  $f_{11} = \frac{l}{EI}$ ;  $f_{21} = \frac{l^2}{2EI}$ ;  $f_{12} = \frac{l^2}{2EI}$ ;  
 $f_{22} = \frac{l^3}{3EI}$

(b)  $f_{11} = \frac{l^3}{3EI}$ ;  $f_{21} = \frac{l^2}{2EI}$ ;  $f_{12} = \frac{l^2}{2EI}$ ;  
 $f_{22} = \frac{l}{EI}$

(c)  $f_{11} = \frac{l}{EI}$ ;  $f_{21} = \frac{l^2}{EI}$ ;  $f_{12} = \frac{l^2}{EI}$ ;  
 $f_{22} = \frac{l^3}{3EI}$

(d)  $f_{11} = \frac{l}{EI}$ ;  $f_{21} = \frac{l^2}{2EI}$ ;  $f_{12} = \frac{l^2}{2EI}$ ;  
 $f_{22} = \frac{l^3}{4EI}$

- Q.30** An agricultural land of 437 ha is to irrigate for a particular crop. The base period of the crop is 90 days and the total depth of water required by crop is 105 cm, if a rainfall of 15 cm occurs during the base period, the duty of irrigation water is  
 (a) 437 ha/cumec (b) 487 ha/cumec  
 (c) 741 ha/cumec (d) 864 ha/cumec

- Q.31** The absolute stiffness of a prismatic member with one end hinged is

(a)  $\frac{2EI}{l}$  (b)  $\frac{4EI}{l}$   
 (c)  $\frac{3EI}{l}$  (d)  $\frac{EI}{l}$



- Q.32** The angle of dispersion of a concentrated load on the flange to the web plate of a steel beam is  
(a) 70 Degrees with horizontal  
(b) 60 Degrees with vertical  
(c) 45 Degrees with vertical  
(d) 30 Degrees with vertical
- Q.33** Sway calculations and non-sway calculations are carried out in a single operation in  
(a) Kani's method  
(b) Moment distribution method  
(c) Unit load method  
(d) None of the given answers
- Q.34** The Eddy's theorem is valid for  
(a) Vertical loads only  
(b) Horizontal loads only  
(c) Dynamic loads only  
(d) All loads
- Q.35** As per IS-875, where access is not provided except for maintenance, live load on roofs, while designing a truss, in respect of its plan area is adopted as  
(a) 100 N/sq.m            (b) 400 N/sq.m  
(c) 750 N/sq.m            (d) 1500 N/sq.m
- Q.36** A steel column in a multi-storeyed structure carries a load of 125 kN. It is built up of 2 ISMC 350 channels connected by lacing. The lacing carries a load of  
(a) 125 kN                (b) 12.5 kN  
(c) 3.125 kN              (d) Zero
- Q.37** An electric pole 5 m high is fixed into the foundation. It carries a wire at the top and is free to move sideways. The effective length of the pole is  
(a) 3.25 m                (b) 4 m  
(c) 5 m                    (d) 10 m
- Q.38** The maximum slenderness ratio of compression members carrying loads resulting from dead loads and superimposed loads is  
(a) 100                    (b) 180  
(c) 150                    (d) 200
- Q.39** The minimum thickness of web plate from corrosion point of view should be  
(a) 12 mm                (b) 6 mm  
(c) 3 mm                 (d) 20 mm
- Q.40** For compression member having the same effective length about any cross-sectional axis, the most preferred section from the point of view of strength is  
(a) a box                 (b) an I-section  
(c) a circular tube        (d) a single angle
- Q.41** In Pigeaud's coefficient method for the analysis of an interior panel of a T-beam bridge  
(a) Notation for coefficient as  $\alpha_x 4$  and  $\alpha_y 4$  includes suffix 4 since panel is continuous on all the 4 edges  
(b) Poisson's ratio of concrete has no contribution  
(c) Applicability is restricted, to the case when wheel load is centrally placed  
(d) Dispersion of load is considered through wearing coat only
- Q.42** The members of a roof truss which carry axial compression are called  
(a) Column                (b) Beam  
(c) Stanchion              (d) Strut
- Q.43** Shape factor for circular section is  
(a)  $\frac{4}{\pi}$                       (b)  $\frac{16\pi}{3}$   
(c)  $\frac{20}{(3\pi)}$                     (d)  $\frac{16}{(3\pi)}$
- Q.44** As per IS-800, the minimum pitch of bolts in a row of bolts is recommended as the diameter of the bolt times  
(a) 2                        (b) 2.5  
(c) 3                        (d) 4
- Q.45** Loss of stress with time at constant strain in steel is called  
(a) relaxation              (b) creep  
(c) shrinkage                (d) Ductility
- Q.46** In a footing, it is usual to assume that the maximum value of transverse bending will occur at a distance, equal to (measured from the face of the column)  
(a) Half the effective depth  
(b) Effective depth  
(c) Twice the effective depth  
(d) None of the given answers

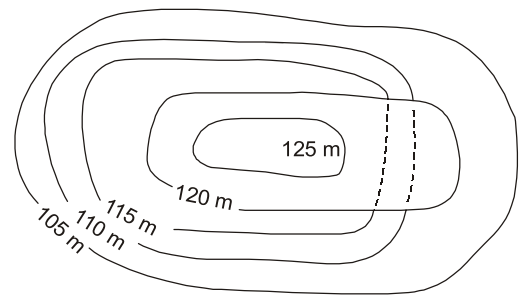
- Q.47** The minimum and maximum % of reinforcement in RCC short column are  
(a) 0.8 and 6 (b) 6 and 0.8  
(c) 0.8 and 4 (d) 4 and 6
- Q.48** A simply supported RC beam carries UDL and is referred as beam A. A similar beam is prestressed and carries the same UDL as the beam A. This beam is referred as beam B. The mid-span deflection of beam A will be  
(a) more than that of beam B  
(b) less than that of beam B  
(c) the same as that of beam B  
(d) generally less but sometimes more depending upon the magnitude of UDL
- Q.49** As the span of a bridge increases, the impact factor  
(a) decreases  
(b) increases  
(c) decreases up to a critical value of span and then increases  
(d) increase up to a critical value of span and then decreases
- Q.50** The neutral axis of the reinforced beam passes through  
(a) centre of gravity of the concrete section  
(b) meta-centre of the concrete section  
(c) centroid of the transformed section  
(d) centroid of the concrete section
- Q.51** The minimum size of the reinforcement bar in RCC column is  
(a) 3 mm (b) 6 mm  
(c) 12 mm (d) 10 mm
- Q.52** Lateral ties in RC columns are provided to resist  
(a) bending moment  
(b) shear  
(c) budding of longitudinal steel bars  
(d) both bending moment and shear
- Q.53** The section in which concrete is not fully stressed to its maximum permissible value while stress in steel reaches its maximum value, is called  
(a) Under reinforced section  
(b) Critical section  
(c) Over reinforced section  
(d) Balanced section
- Q.54** In a slab, the transverse reinforcement is provided at \_\_\_\_\_ to the span of the slab.  
(a) 45 degrees  
(b) 60 degrees  
(c) 75 degrees  
(d) Right angle
- Q.55** When the ratio of effective length of the column to its least lateral dimension does not exceed 15, it is termed as a  
(a) Long column  
(b) Short column  
(c) Plain column  
(d) None of the given answers
- Q.56** What type of stresses are artificially induced by Prestressed concrete in a structure before it is loaded?  
(a) Tensile (b) Torsional  
(c) Shear (d) Compressive
- Q.57** In a prestressed concrete member  
(a) High strength concrete should be used  
(b) Normal strength concrete should be used  
(c) High strength concrete and low tensile steel should be used  
(d) High strength concrete and high tensile steel should be used
- Q.58** Drops are provided in flat slab to resist primarily  
(a) bending moment (b) thrust  
(c) shear (d) torsion
- Q.59** Total amount of shrinkage strain for a pretensioned member is  
(a)  $3 \times 10^{-4}$  (b)  $3 \times 10^{-5}$   
(c)  $3 \times 10^{-6}$  (d)  $3 \times 10^{-7}$
- Q.60** The important events located on the activities in a bar chart are known as  
(a) Key events (b) Key stones  
(c) Milestones (d) Key points
- Q.61** PERT stands for  
(a) Programme evaluation and research technique  
(b) Programme examination and review technique  
(c) Programme examination and research technique  
(d) Programme evaluation and review technique

- Q.62** Fulkerson's rule stands for  
(a) Planning the events  
(b) Scheduling the events  
(c) Numbering the events  
(d) Controlling the events
- Q.63** If the values of  $t_o$ ,  $t_f$ ,  $t_p$  are 8, 12 and 18, the value of  $t_e$  is  
(a) 12.1 (b) 12.3  
(c) 12.6 (d) 13
- Q.64** In time estimates PERT follows  
(a) Probabilistic approach  
(b) Deterministic approach  
(c) Possibility approach  
(d) Non-Probabilistic approach
- Q.65** If the values of  $t_o$ ,  $t_p$  of an activity are 4 and 15, what is the variance of the activity?  
(a) 3.22 (b) 3.36  
(c) 3.87 (d) 3.92
- Q.66** The difference between the total float and free float is known as  
(a) Free float  
(b) Total float  
(c) Independent float  
(d) Interfering float
- Q.67** The duration of an activity  $i-j$  is 8. The (EPO) $_j$  is 18. The EST is 5. What is the Free float of  $i-j$   
(a) 5 (b) 13  
(c) 10 (d) 8
- Q.68** Acoustics of an auditorium is considered to be excellent when its reverberation time is between  
(a) 0.50 and 1.50 s (b) 1.50 and 2.00 s  
(c) 2.00 and 3.00 s (d) 3.00 and 5.00 s
- Q.69** The difference between the latest allowable time and earliest expected time of an event is known as  
(a) Float (b) Normal Deviate  
(c) Free Float (d) Slack
- Q.70** With the increase of time, the direct costs of the project  
(a) increase  
(b) decrease  
(c) remain constant  
(d) decrease and then increase
- Q.71** Resource smoothing will be adopted when  
(a) resources are unlimited  
(b) resources are limited  
(c) resources are constant  
(d) in all the cases
- Q.72** A 6 hour storm with intensities of 5, 7, 12, 20, 16 and 2 mm/hr produced a runoff of 30 mm. Then  $\phi$ -index is  
(a) 6.25 mm/hr (b) 5.33 mm/hr  
(c) 6.00 mm/hr (d) 5.00 mm/hr
- Q.73** Sprinkler irrigation is not suitable to  
(a) Rice  
(b) Fodder  
(c) Lawn  
(d) None of the given answers
- Q.74** For irrigation, water having SAR above 26  
(a) Can be used for all soils and for all crops  
(b) Can be used for all soils except fine textured soils  
(c) Can be used for all soils if some precautions are taken  
(d) is not used for any irrigation
- Q.75** As per IS 4987,  $N = \left(\frac{C_v}{P}\right)^2$  where  $N =$   
optimum number of raingauge stations in a basin,  $C_v =$  coefficient of variation of the rainfall values of the existing raingauge stations, then  $P$  is  
(a) Highest discharge at the basin outlet  
(b) Annual average rainfall of the basin  
(c) Desired degree of percentage error in the estimate of the basin mean rainfall.  
(d) Highest rainfall recorded in the basin
- Q.76** Defective air circulation in plant's root zone is an effect of  
(a) Mixed cropping  
(b) Fall in soil moisture content  
(c) Water logging  
(d) High temperatures
- Q.77** In the design of impervious apron by Khosla's theory for weirs, the horizontal length of the apron is found by the consideration of

- (a) Velocity of flow over the weir  
 (b) Permissible exit gradient  
 (c) Scouring depth  
 (d) Design discharge
- Q.78** For no tension to develop in the gravity dam the resultant of all the external forces should always lie  
 (a) At the centre of the base  
 (b) Within the middle third portion of the base  
 (c) Within the d/s third portion  
 (d) With the u/s third portion
- Q.79** The first watering given to a crop, when the crop is a few centimeters high, is called  
 (a) Paleo irrigation  
 (b) Kor watering  
 (c) Leaching  
 (d) None of the given answers
- Q.80** Specific capacity of a confined well  
 (a) is constant at all drawdowns  
 (b) increases with increasing discharge  
 (c) decreases with increasing discharge  
 (d) is constant at all discharges
- Q.81** Field capacity and optimum moisture content of a soil of density 1.3 g/cc are 28% and 16% respectively. If effective depth of root zone is 70 cm, water available for evapotranspiration is  
 (a) 25.4 cm                      (b) 22.29 cm  
 (c) 14.56 cm                      (d) 10.92 cm
- Q.82** Flow duration curve is a convenient tool to assess the available at the site  
 (a) Firm power                      (b) Secondary power  
 (c) Tertiary power                      (d) Average power
- Q.83** The best method of estimating runoff is  
 (a) Unit Hydro graph  
 (b) Runoff-Coefficient Method  
 (c) Rational formula  
 (d) Infiltration index method
- Q.84** Blue baby disease may be caused in infants due to drinking water containing higher concentrations of  
 (a) Nitrites                      (b) Nitrates  
 (c) Lead                      (d) Arsenic
- Q.85** Sedimentation is the process related to  
 (a) Floating material in rivers  
 (b) Bed material carried by flowing water  
 (c) Cutting land for channeling  
 (d) Seepage into Embankments
- Q.86** If uplift is not considered, base width of elementary profile of gravity dam of height  $H$  and specific gravity  $\rho$  is given by  
 (a)  $b = \frac{H}{\sqrt{\rho}}$                       (b)  $b = \frac{H}{\sqrt{\rho - 1}}$   
 (c)  $b = \frac{H}{\sqrt{2\rho}}$                       (d)  $b = \frac{H}{\sqrt{\rho + 1}}$
- Q.87** An important hydraulic failure of earth dams is  
 (a) Piping  
 (b) Sloughing  
 (c) Upstream slope failure due to sudden drawdown  
 (d) Overtopping
- Q.88** The ratio of rate of change of discharge of a canal outlet to the rate of the change of the discharge of the distributing channel is known as  
 (a) Proportionality                      (b) Flexible  
 (c) Sensitivity                      (d) Drowning ratio
- Q.89** Three turbines each of capacity 10000 kW are installed at a hydel power station. If the peak load and the average load produced during a certain period are 25000 kW and 15000 kW respectively, then load factor and plant factor are respectively equal to  
 (a) 60% and 50%                      (b) 50% and 60%  
 (c) 40% and 50%                      (d) 50% and 40%
- Q.90** In design of alluvial channels, for computing mean velocity of flow, Kennedy used  
 (a) Chezy's formula  
 (b) Manning's formula  
 (c) Kutter's formula  
 (d) Bazin's formula
- Q.91** The design period for clear water conveying mains is  
 (a) 15 years                      (b) 30 years  
 (c) 50 years                      (d) 100 years

- Q.92** Slow sand filters require  
 (a) Finer sand  
 (b) Coarser sand media  
 (c) Medium sand media  
 (d) Any type of sand media
- Q.93** A sudden change in the flow velocity or pressure created in water pipe line due to sudden closure of valve is called  
 (a) Boiling (b) Implosion  
 (c) Vibration (d) Water hammer
- Q.94** The minimum diameter for public sewer in hilly areas where steep slopes are prevalent is  
 (a) 300 (b) 150  
 (c) 100 (d) 50
- Q.95** Due to incomplete combustion of fuels from petrol engines, the gas liberated is  
 (a) CO<sub>2</sub> (b) CO  
 (c) N<sub>2</sub> (d) He
- Q.96** Design period for slow sand filters as suggested by CPHEEO is  
 (a) 50 years (b) 30 years  
 (c) 25 years (d) 10 years
- Q.97** Treatment required for raw water containing only carbon dioxide and odourous gases is  
 (a) Plain sedimentation and chlorination  
 (b) Chlorination only  
 (c) Aeration followed by disinfection  
 (d) Softening and chlorination
- Q.98** In connection line from water main to building, goose-neck is provided to  
 (a) quickly open or stop the flow to building  
 (b) avoid stresses and strains on the joint due to temperature variations and vibrations  
 (c) detect leakages in pipe line  
 (d) to provide additional connections in future
- Q.99** Sludge digestion is done by the \_\_\_\_\_ bacteria  
 (a) pathogenic (b) facultative  
 (c) anaerobic (d) aerobic
- Q.100** The sluice valves used for dewatering the pipe line are called  
 (a) Scour valve  
 (b) Safety valve  
 (c) Sectionalizing valve  
 (d) Discharge control valve
- Q.101** The collapsible soil is associated with  
 (a) Dune sands (b) Laterite soils  
 (c) Loess (d) Black cotton soils
- Q.102** The probability that a 100 yr flood is equalled or exceeded at once in 100 yr is  
 (a) 0.99 (b) 0.64  
 (c) 0.36 (d) 0.1
- Q.103** The gaseous pollutants such as hydro carbons and carbon monoxides can be effectively controlled by  
 (a) Combustion or incineration  
 (b) Electrostatic precipitators  
 (c) Gravity settling chambers  
 (d) Fabric filters
- Q.104** According to ambient air quality standards in respect of noise (MOEF) mention noise limits for silence zone in day time  
 (a) 40 dB (A) Leq (b) 45 dB (A) Leq  
 (c) 50 dB (A) Leq (d) 75 dB (A) Leq
- Q.105** Disposal of refuse by Bangalore method involves  
 (a) Aerobic method of composting  
 (b) Anaerobic method of composting  
 (c) Pulverization  
 (d) Pyrolysis
- Q.106** Degree of saturation ( $s$ ) of a soil mass is expressed in terms of volume of water ( $V_w$ ) and volume of voids ( $V_v$ ) as  
 (a)  $S = \frac{(V_v V_w)}{100}$  (b)  $S = 100 \left( \frac{V_w}{V_v} \right)$   
 (c)  $S = 100 \left( \frac{V_v}{V_w} \right)$  (d)  $S = 100(V_v - V_w)$
- Q.107** A sample of saturated soil has a water content of 29.6%. If the specific gravity of solids is 2.7, the dry unit weight (in gr/cm<sup>3</sup>) of the soil is equal to  
 (a) 0.5 (b) 0.75  
 (c) 1 (d) 1.5
- Q.108** Lacustrine soils according to geological classifications are  
 (a) Transported by ice  
 (b) Transported by wind  
 (c) Deposited in seas  
 (d) Deposited in lakes

- Q.109** If two soils S1 and S2 tested in the laboratory are having liquid limits 38% and 60% and plastic limits 18% and 20% respectively. If natural moisture content for S1 and S2 is 40% and 50% respectively, which soil is a better foundation material when remoulded.
- (a) S1 (b) S2  
(c) S1 and S2 (d) Neither S1 nor S2
- Q.110** Neutral stress within a soil mass is also known as
- (a) Pore water pressure  
(b) Effective stress  
(c) Geostatic stress  
(d) Static shear stress
- Q.111** The maximum force per unit area that needs to be placed over an expansive soil to prevent value increase is known as
- (a) Pore water pressure  
(b) Swelling pressure  
(c) Safe bearing capacity  
(d) Plastic limit
- Q.112** The diameter of enlarged bore or bulb for under reamed piles used in expansive soils is generally taken as
- (a) 0.3 – 0.6 times the length of the pile  
(b) 1.5 – 1.2 times the pile shaft dia  
(c) 2 to 3 times the pile shaft dia  
(d) 1000 mm
- Q.113** The latitude and departure of a line AB are +78 m and –45.1 m respectively. The whole circle bearing of the line AB is
- (a) 30° (b) 150°  
(c) 210° (d) 330°
- Q.114** What is the angle between two plane mirrors of an optical square
- (a) 30° (b) 45°  
(c) 60° (d) 90°
- Q.115** The sum of specific yield and specific retention is equal to
- (a) Porosity  
(b) Permeability coefficient  
(c) Storage coefficient  
(d) Saturation percentage
- Q.116** A layer of soil having  $G = 2.67$  and  $e = 0.67$  is subjected to an upward head of 1.5 m due to seepage of water. The depth of the soil layer required to provide a factor of safety 2 against piping is
- (a) 1.5 m (b) 2.0 m  
(c) 3.0 m (d) 0.75 m
- Q.117** Boussinesque's solution for the stresses in soil caused by a point load at the surface is based on some assumptions. One of which is
- (a) Soil medium is finite medium  
(b) Soil medium is plastic  
(c) Soil medium obeys Hook's law  
(d) Soil medium is not homogeneous
- Q.118** The failure plane in direct shear test is
- (a) Horizontal  
(b) Vertical  
(c) Inclined at 45° to the horizontal  
(d) Unpredictable
- Q.119** When retaining wall is stationary, the coefficient of earth pressure at rest is equal to (taking Poisson's ratio of soil as  $\mu$ )
- (a)  $\frac{\mu}{(1-\mu)}$  (b)  $\frac{\mu}{(1+\mu)}$   
(c)  $\frac{2\mu}{(1-\mu)}$  (d)  $\frac{\mu}{(1-\mu)^2}$
- Q.120** In sands, during earthquakes, instantaneous pore pressures are likely to develop leading to sudden and total loss of shearing strength. This phenomenon is known as
- (a) quicksand (b) liquefaction  
(c) damping (d) scouring
- Q.121** The contours given below represent



- (a) Depression (b) Summit  
(c) Saddle (d) Over hanging cliff

- Q.122** Digital elevation model is generated using  
 (a) Digitisation  
 (b) Contour interpolation  
 (c) Hydro graphic analysis  
 (d) Thiessen polygon method
- Q.123** Remote sensing work where system has no energy source of its own but depends on external source of energy is called  
 (a) Active remote sensing  
 (b) Passive remote sensing  
 (c) SLAR  
 (d) LIDAR
- Q.124** In triangulation, the best shape of a triangle from the following is  
 (a) isosceles with base angle  $56^{\circ}14'$   
 (b) isosceles with base angle  $65^{\circ}14'$   
 (c) isosceles with base angle  $36^{\circ}14'$   
 (d) isosceles with base angle  $76^{\circ}14'$
- Q.125** The number of GPS Satellites required for GPS receiver to correctly draw 3 D map to locate the geo graphical position of the object over the earth surface is  
 (a) 1 (b) 2  
 (c) 3 (d) 4
- Q.126** An electronic theodolite combined with EDM is popularly known as  
 (a) GPS (b) Total station  
 (c) Auto Level (d) Compass
- Q.127** It is a common practice to design a highway to accommodate the traffic volume corresponding to  
 (a) 30<sup>th</sup> hour (b) peak hour  
 (c) none (d) 15-min peak period
- Q.128** The poles of the celestial horizon are called  
 (a) Zenith and Nadir  
 (b) North and South poles  
 (c) Perihelion and aphelion  
 (d) Perigee and apogee
- Q.129** The RL of the floor in a building is 100.00 m and the staff reading on the floor is 1.40 m. If the reading on the staff when held inverted with bottom touching the T-Beam of the slab is 3.60 m, then the height of the T-Beam bottom above the floor is equal to  
 (a) 2.20 m (b) 2.50 m  
 (c) 5 m (d) 95 m
- Q.130** An error in observations of either fore or back bearing or both may be due to  
 (a) Magnetic declination  
 (b) Dip  
 (c) Local attraction  
 (d) Inclination
- Q.131** In a theodolite, if line of altitude bubble is not parallel to the line of collimation when verniers of vertical circle read zero, the error is known as  
 (a) Vertical axis error  
 (b) Lateral collimation error is  
 (c) Horizontal axis error  
 (d) Vertical collimation error
- Q.132** The plane table method which is suitable for locating inaccessible points is  
 (a) Resection method  
 (b) Intersection method  
 (c) Radiation method  
 (d) Traversing method
- Q.133** If the stadia interval and the focal length of tachometer are 12 mm and 24 cm respectively, then the multiplying constant of the tachometer is equal to  
 (a) 0.005 (b) 20  
 (c) 100 (d) 200
- Q.134** If  $L$  denotes latitude and  $D$  denotes departure, then the direction of closing error is given by  
 (a)  $\tan^{-1}\left(\frac{\sum D}{\sum L}\right)$  (b)  $\operatorname{cosec}^{-1}\left(\frac{\sum D}{\sum L}\right)$   
 (c)  $\cos^{-1}\left(\frac{\sum D}{\sum L}\right)$  (d)  $\sin^{-1}\left(\frac{\sum D}{\sum L}\right)$
- Q.135** In leveling, curvature correction is given by  
 (a)  $C_c = \frac{D^2}{(R)}$  (b)  $C_c = \frac{D}{(2R)}$   
 (c)  $C_c = \frac{D^2}{(2R)}$  (d)  $C_c = \frac{D}{R}$
- Q.136** The absolute minimum radius for a horizontal curve designed for a speed of 80 kmph, given the permissible values of super elevation and coefficient of friction are 0.05 and 0.15 respectively  
 (a) 252 m (b) 458 m  
 (c) 150 m (d) 105 m

- Q.137** The longitudinal gradient on a road is 1 in 20. If the radius of curve is 76 m, compensated gradient is  
(a) 0.01 (b) 0.015  
(c) 0.04 (d) 0.05
- Q.138** The maximum super elevation to be provided on a road curve is 1 in 15. If the rate of change of super elevation is specified as 1 in 120 and the road width including widening is 12 m then the minimum length of the transition curve is (when the outer edge is raised with respect to inner edge)  
(a) 180 m (b) 125 m  
(c) 96 m (d) 48 m
- Q.139** The gradient which in the normal course must never be exceeded in any part of the road is called as  
(a) Ruling gradient  
(b) Limiting gradient  
(c) Exceptional gradient  
(d) Escape gradient
- Q.140** Which of the following is not considered as design vehicles in IRC-3-1983?  
(a) Single unit truck  
(b) Semi trailer combination  
(c) Truck trailer combination  
(d) Passenger car
- Q.141** Which type of coordinated signal system is not conducive to give continuous movement of all vehicles as given in IRC 93-1985?  
(a) Flexible progressive system  
(b) Limited progressive system  
(c) Simple progressive system  
(d) Simultaneous system
- Q.142** Bed width (B) and depth (D) of roof economical section for a rectangular drains as per IRC guidelines on urban drainage shall be related as  
(a)  $B = D$  (b)  $B = 1.5D$   
(c)  $B = 2D$  (d)  $B = \frac{2D}{3}$
- Q.143** Widening at curves provided to compensate the extra width occupied by a vehicle on the curve due to tracking of the rear wheels is called  
(a) Mechanical widening  
(b) Psychological widening  
(c) Super widening  
(d) Extra widening
- Q.144** As per IRC code for flexible pavements, designed life for National Highways and State Highways should be  
(a) 20 years (b) 15 years  
(c) 10-15 years (d) <10 years
- Q.145** The multiplier applied to convert the number of commercial vehicles of different axles loads and axle configuration to the number of standard axle load repetitions is called  
(a) Lane distribution factor  
(b) Vehicle damage factor  
(c) Safe load factor  
(d) Load distribution factor
- Q.146** Value of camber provided for straight sections of roads in areas of high intensity of rainfall is \_\_\_\_\_ than/to that provided for the areas of low intensity of rainfall.  
(a) Steeper  
(b) Milder  
(c) Equal  
(d) None of the given answers
- Q.147** The safe stopping distance for a two way traffic in a two lane road is 61.4 m, then for a two way traffic in a single lane road when other conditions are unaltered the safe stopping distance will be taken as  
(a) 30.7 m (b) 61.4 m  
(c) 92.1 m (d) 122.8 m
- Q.148** Map cracking is the common type of failure in  
(a) Rigid pavements  
(b) Cement concrete pavements  
(c) Gravel roads  
(d) Bituminous surfacing
- Q.149** The most effective and economical method to stabilize Black Cotton Soils is  
(a) Cement stabilisation  
(b) Lime stabilization with suitable additives  
(c) Thermal stabilization  
(d) None of the given answers
- Q.150** Equivalent factor of PCU for trucks is  
(a) 0.5 (b) 1  
(c) 3 (d) 4