

**PAPER- I**

Marks: 100

Time: 120 minutes

ROLL NO.: _____	NAME: _____
SIGNATURE: _____	DATE / TIME: _____

**INSTRUCTIONS FOR THE CANDIDATES**

1. Before attempting the paper carefully read out all the Instructions & Examples given on Side 1 of Answer Sheet (OMR Sheet) supplied separately.
2. At the start of the examination, please ensure that all pages of your Test booklet are properly printed; your Test booklet is not damaged in any manner and contains 100 questions. In case of any discrepancy the candidate should immediately report the matter to the invigilator for replacement of Test Booklet. No claim in this regard will be entertained at the later stage.
3. An **OMR Answer Sheet** is being provided separately along with this Test booklet. Please fill up all relevant entries like Roll Number, Test Booklet Code etc. in the spaces provided on the OMR Answer Sheet and put your signature in the box provided for this purpose.
4. Make sure to fill the correct Test booklet code on Side 2 of the OMR Answer Sheet. If the space for the Booklet Code is left blank or more than one booklet code is indicated therein, it will be deemed to be an incorrect booklet code & Answer Sheet will not be evaluated. The candidate himself/herself will be solely responsible for all the consequences arising out of any error or omission in writing the test booklet code.
5. **This Test Booklet consists of 7 pages containing 100 questions.** Against each question four alternative choices (1), (2), (3), (4) are given, out of which one is correct. Indicate your choice of answer by darkening the suitable circle with **BLACK/BLUE pen** in the OMR Answer Sheet supplied to you separately. Use of Pencil is strictly prohibited. More than one answer indicated against a question will be deemed as incorrect response.
6. The maximum marks are 100. Each question carries one mark. **There will be no negative marking. The total time allocated is 2 Hours.**
7. Do not fold or make any stray marks on the OMR Answer Sheet. Any stray mark or smudge on the OMR Answer Sheet may be taken as wrong answer. Any damage to OMR Answer Sheet may result in disqualification of the candidate.
8. **On completion of the test, candidate must hand over the Test Booklet and OMR Answer Sheet to the invigilator on duty in the room/hall.**
9. **Use of Mobile phones and calculators etc. are not allowed.**
10. **Keep all your belongings outside the Examination hall. Do not retain any paper except the ADMIT CARD.**

1	Which of the following methods of applying water may be used on rolling land? (1) boarder flooding (2) check flooding (3) furrow flooding (4) free flooding
2	A bar chat is drawn for (1) time versus activity (2) activity versus resources (3) resources versus progress (4) progress versus time
3	If the slump of concrete mix is 70mm, its workability is considered to be (1) very low (2) low (3) medium (4) high
4	The moment of inertia of a square of side (a) about an axis through its centre of gravity is (1) $a^4 / 4$ (2) $a^4 / 8$ (3) $a^4 / 12$ (4) $a^4 / 36$
5	For bars in tension, a standard hook has an anchorage value equivalent to a straight length of (1) $8 \varnothing$ (2) $12 \varnothing$ (3) $16 \varnothing$ (4) $24 \varnothing$
6	In a Pelton-wheel, hydraulic efficiency will be maximum when speed of the buckets as compared to velocity of the jet will be (1) Equal (2) Double (3) Half (4) One Fourth
7	The slope of sewer shall be (1) given in the direction of natural slope of ground (2) given in the opposite direction of natural slope of ground (3) zero (4) steeper than 1 in 20
8	Wetted perimeter of a regime channel for a discharge of 64 cumecs as per Lacey's theory will be (1) 19m (2) 38m (3) 57m (4) 76m
9	The chamber and gradient on earthen roads should not be more than (1) 1 in 10 (2) 1 in 20 (3) 1 in 50 (4) 1 in 80
10	The result of ring and ball softening point test on asphalts is given in terms of (1) Viscosity (2) Time (3) Flow (4) Temperature
11	The moisture content in a well seasoned timber is (1) 5 to 7% (2) 15 to 20% (3) 13 to 18% (4) 10 to 12%
12	The relation between duty D in hectares/cumec, depth of water $\Delta$ in meters and base period B in days is given by (1) $\Delta = \frac{1.98 B}{D}$ (2) $\Delta = \frac{8.64 B}{D}$ (3) $\Delta = \frac{5.68 B}{D}$ (4) $\Delta = \frac{8.64 D}{B}$
13	Modulus of rupture of concrete is a measure of (1) flexural tensile strength (2) direct tensile strength (3) compressive strength (4) split tensile strength
14	A man hole is generally provided at each (1) Bend (2) Junction and change of sewer dia (3) Change of gradient (4) All of the above
15	Thickness of plastering is usually (1) 6mm (2) 12mm (3) 25mm (4) 40mm
16	The output of a mason for half brick wall in partition is expected to be (1) 5 sq.m. per day (2) 15 sq.m. per day (3) 25 sq.m. per day (4) 45 sq.m. per day
17	The compulsory test conducted for rails is (1) Hammer test (2) Falling weight test (3) Tensile test (4) Both (a) and (b)
18	The distance formula $Q = Cd \sqrt{2gh} \times A$ is used for rectangular (1) small orifices only (2) large orifices only (3) both (1) and (2) (4) for all type of orifices
19	For joining sewer pipes of diameter larger than 0.6 m. the preferred joint is (1) collar joint (2) simplex joint (3) socket and spigot joint (4) lock joint
20	Uniform seasoning of wood is done by (1) Vapour seasoning (2) Water seasoning (3) Electric seasoning (4) Kiln seasoning
21	The maximum differential settlement, in case of foundation on sandy soils is generally limited to (1) 1mm (2) 5mm (3) 20mm (4) 25mm

22	The most suitable material for the central impervious core of a zoned embankment type dam is (1) clay                      (2) coarse sand              (3) silty clay              (4) clay mixed with fine sand
23	The bulk density of a material depends on (1) Void content              (2) Moisture content              (3) Porosity              (4) All of the above
24	The highest point on a carriage way is known as (1) Crown                      (2) Camber                      (3) Super elevation              (4) Gradient
25	Which of the following unit works in anaerobic conditions? (1) sludge digestion tank              (2) sedimentation tank (3) activated sludge treatment              (4) trickling filters
26	The soundness of cement is tested by (1) Le-chatelier apparatus              (2) Compression test (3) Vicats apparatus              (4) Shores tester
27	A property fetches a net annual income of Rs. 900 deducting all out goings. If the rate of interest is 6% the capitalized value of the property would be (1) Rs. 900                      (2) Rs. 9000                      (3) Rs. 15000                      (4) Rs. 39000
28	Most suitable material for highway embankments is (1) granular soil                      (2) organic soil                      (3) silts                      (4) clays
29	The normal size of the ballast used for points and crossings is (1) 10mm                      (2) 25mm                      (3) 40mm                      (4) 50mm
30	The rails are made of (1) Cast iron                      (2) Mild Steel                      (3) High Carbon Steel                      (4) High Speed Steel
31	The drains constructed on up slope of hill sides, are known as (1) Cross drains                      (2) Under drains                      (3) Catch water drains                      (4) Side drains
32	To perform the initial setting time test, the water is added to the cement at the rate of by weight of cement (1) 0.72 P                      (2) 0.78 P                      (3) 0.85 P                      (4) 0.95 P
33	A bond produced by laying alternate courses wholly composed of headers or stretchers, is known as (1) Stretcher – header bond                      (2) Header – stretcher bond (3) English bond                      (4) Flemish bond
34	The uplift pressure on a dam can be controlled by (i) constructing cutoff under upstream face (ii) constructing drainage channels between the dam and its foundation (iii) by pressure grouting in foundation The correct answer is (1) only (i)                      (2) both (i) and (ii)                      (3) both (i) and (iii)                      (4) (i), (ii) and (iii)
35	The shear force on a beam causes (1) Linear transverse displacement                      (2) Curved displacement (3) No displacement                      (4) Rotation of the planes
36	As the elastic limit reaches, tensile strain (1) increases more rapidly                      (2) decreases more rapidly (3) increases in proportion to the stress                      (4) decreases in proportion to the stress
37	The defect in painting over a smooth and glossy surface due to which paint does not stick to the surface, is known as (1) Scaling                      (2) Alligating                      (3) Sagging                      (4) Blistering
38	One cubic meter of sand will roughly weigh (1) 100 kg                      (2) 600 kg                      (3) 1600 kg                      (4) 2600 kg
39	The number of seismic zones in which the country has been divided are (1) 3                      (2) 5                      (3) 6                      (4) 4
40	The deflection of any rectangular beam simply supported is (1) directly proportional to its weight (2) inversely proportional to its width (3) inversely proportional to the cube of its depth (4) directly proportional to the cube of its length
41	Lapped splices in tensile reinforcement are generally not used for bars of size larger than (1) 18mm diameter                      (2) 24mm diameter (3) 30mm diameter                      (4) 36mm diameter

42	The quantity of arch masonry work is calculated by the relation (1) Span of arch X breadth of wall X thickness of arch (2) Mean length of arch X breadth of wall X thickness of arch (3) (Span of arch + 2 X breadth of wall) X thickness of arch (4) Outer length of arch X breadth of wall – thickness of arch
43	The railway station at which a track line meets a main line is called (1) Way side station (2) Junction station (3) Terminal station (4) Flag station
44	The individual variation between test strength of sample should not be more than (1) $\pm 5\%$ of average (2) $\pm 10\%$ of average (3) $\pm 15\%$ of average (4) $\pm 20\%$ of average
45	ABCD is a rectangular plot of land. If the bearing of the side AB is $75^\circ$ , the bearing of DC is (1) $75^\circ$ (2) $255^\circ$ (3) $105^\circ$ (4) $285^\circ$
46	1% of voids in a concrete mix would reduce its strength by about (1) 5% (2) 10% (3) 15% (4) 20%
47	Softening point of bitumen to be used for road construction at a place where maximum temperature is $40^\circ\text{C}$ should be (1) less than $40^\circ\text{C}$ (2) greater than $40^\circ\text{C}$ (3) equal to $40^\circ\text{C}$ (4) None of the above
48	For walls, columns and vertical faces of all structural members, the form work is generally removed after (1) 24 to 48 hours (2) 3 days (3) 7 days (4) 14 days
49	Whenever an activity has zero total float, then (1) free float of the activity must be zero but independent float need not be zero (2) independent float must be zero but free float need not be zero (3) free float and independent float both must be zero (4) free float and independent float both need not be zero
50	In a slab, the pitch of the main reinforcement should not exceed its effective depth (1) three times (2) four times (3) five times (4) two times
51	In brick masonry the frog of the brick is generally kept on (1) Top face (2) Bottom face (3) Exposed face (4) Interior face
52	The gradual exhaustion of the usefulness of a property is known as (1) Devaluation (2) Revaluation (3) Depreciation (4) Appreciation
53	The discharge of a liquid of kinematic viscosity $4\text{ cm}^2/\text{sec}$ through a $8\text{ cm}$ diameter pipe is $3200\pi\text{ cm}^3/\text{sec}$ . The type of flow expected is (1) laminar flow (2) transition flow (3) turbulent flow (4) not predictable from the given data
54	A vertical triangular area with vertex downward and altitude 'h' has its base lying on the free surface of a liquid. The centre of pressure below the free surface is at a distance (1) $h/4$ (2) $h/3$ (3) $h/2$ (4) $2h/3$
55	The different between the most probable value of a quantity and its observed value is (1) true error (2) weighted observation (3) conditional error (4) residual error
56	The shear strength of a soil (1) increase with an increase in the normal stress (2) is proportional to the cohesion of the soil (3) is generally known as the strength of the soil (4) All of the above
57	The point of contraflexure is a point where (1) shear force changes sign (2) bending moment changes sign (3) shear force is maximum (4) bending moment is maximum
58	For any steel pipe work, important dimension is (1) Length (2) Diameter (3) Gauge (4) All of the above
59	The workability of concrete is defined as the (1) ease with which it can be mixed, transported and placed in position in a homogeneous state (2) breaking up of cohesion in a mass of concrete (3) separation of water or water-cement mixture from the freshly mixed concrete (4) none of the above
60	A hydroelectric scheme operating under a head of $80\text{ m}$ will be classified as (1) low head scheme (2) medium head scheme (3) high head scheme (4) none of the above

61	In a simply supported slab the minimum spacing of distribution reinforcement should be four times the effective thickness of the slab or (1) 20 cm                      (2) 30 cm                      (3) 40 cm                      (4) 60 cm
62	The reception signal is (i) outer signal (ii) home signal (iii) starter (iv) advanced starter The correct answer is (1) (i) and (ii)                      (2) (ii) and (iii)                      (3) (iii) and (iv)                      (4) (i) and (ivd)
63	Contours of different elevations may cross each other only in case of (1) an over hanging cliff                      (2) a vertical cliff                      (3) a saddle                      (4) an inclined plane
64	Two like parallel forces are acting at a distance of 24mm apart and their resultant is 20N. If the line of action of the resultant is 6mm from any given force, the two forces are (1) 15 N and 5 N                      (2) 20 N and 5 N                      (3) 15 N and 15 N                      (4) none of these
65	The shear strength of a soil in the plastic limit state is (1) Zero                      (2) Reasonable (3) Small                      (4) Close to saturated soil strength
66	For class A Airport the difference of reduced levels of higher and lower edges of the control surface is (1) 25 m                      (2) 50 m                      (3) 75m                      (4) 100m
67	In general brittle materials have adequate resistance to (1) Compression                      (2) Bending                      (3) Tension                      (4) Impacts
68	Creep of rails is measured by (1) Creep indicator                      (2) Fishing string                      (3) Anchors                      (4) None of these
69	The time required by rain water to reach the outlet of drainage is generally called (1) time of concentration                      (2) time of overland flow (3) concentration time of overland flow                      (4) duration of the rainfall
70	A brick masonry can fail due to (1) Crushing due to over loading                      (2) Shearing along a horizontal plane (3) Rupture along a vertical joint                      (4) Any of the above
71	Uniform flow is said to occur when (1) size and shape of the cross-section in a particular length remain constant (2) size and shape of the cross-section change along a length (3) frictional loss in the particular length of the channel will be more than the drop in its elevation (4) frictional loss in the particular length of the channel will be loss than the drop in elevation
72	The forces which do not meet at one point and their lines of action do not lie on the same plane are known as (1) coplanar concurrent forces                      (2) coplanar non-concurrent forces (3) non-coplanar concurrent forces                      (4) none of these
73	Which of the following represents hardest grade of bitumen? (1) 30/40                      (2) 60/70                      (3) 80/100                      (4) 100/120
74	The percentage of fine aggregate to the combined aggregate (P) is obtained by the relation (1) $P = \frac{X + Y}{X + Z} \times 100$ (2) $P = \frac{X - Y}{X - Z} \times 100$ (3) $P = \frac{X - Z}{Z - Y} \times 100$ (4) $P = \frac{Z - Y}{X - Z} \times 100$
75	The resultant of two forces P and Q (such that P>Q) acting along the same straight line, but in opposite direction, is give by (1) P + Q                      (2) P – Q                      (3) P / Q                      (4) Q / P
76	Time and progress chart are also known as (1) bar chart                      (2) modified milestone chart (3) critical path method chart                      (4) all of these
77	Alum increases (1) Hardness of water                      (2) Carbonates in water (3) Sulphates in water                      (4) Acidity of water

<b>78</b>	Which of the following is considered to be the highest quality construction in the group of black top pavements? (1) Mastic asphalt (2) Sheet asphalt (3) Bituminous carpet (4) Bituminous concrete
<b>79</b>	A beam of rectangular cross-section is 100mm wide and 200mm deep. If the section is subjected to a shear force of 20 kN, then the maximum shear stress in the section is (1) 1 N/mm <sup>2</sup> (2) 1.125 N/mm <sup>2</sup> (3) 1.33 N/mm <sup>2</sup> (4) 1.5 N/mm <sup>2</sup>
<b>80</b>	Administrative head of public works department who is directly responsible to government is (1) S.D.O. (2) Executive engineer (3) Super intending engineer (4) Chief engineer
<b>81</b>	The bulk density of a soil can be defined as (1) Ratio of the weight of the solids to the volume of the solids (2) Unit weight of the soil (3) Unit weight of soil under saturated condition (4) Ratio of the unit weight of soil to that of water
<b>82</b>	The camber of shoulders in water bound macadam roads is (1) equal to the cross slope of pavement (2) less than the cross slope of pavement (3) greater than the cross slope of pavement (4) zero
<b>83</b>	Maximum percentage reinforcement in case of slabs is limited to (1) 2 (2) 4 (3) 6 (4) 8
<b>84</b>	A negative declination shows that the magnetic meridian is to the (1) eastern side of the true meridian (2) western side of the true meridian (3) southern side of the true meridian (4) None of the above
<b>85</b>	Size of a theodolite is specified by (1) the length of telescope (2) the diameter of vertical circle (3) the diameter of lower plate (4) the diameter of upper plate
<b>86</b>	If the body falls freely under gravity, then the gravitational acceleration is taken as (1) + 80.9 m/s <sup>2</sup> (2) - 80.9 m/s <sup>2</sup> (3) + 9.8 m/s <sup>2</sup> (4) - 9.8 m/s <sup>2</sup>
<b>87</b>	The slope of the line joining the crown and edge of the road surface is known as (1) Cross fall (2) Cross-slope (3) Camber (4) Any of the above
<b>88</b>	The minimum particle size of fine aggregate is (1) 0.0075 mm (2) 0.075 mm (3) 0.75 mm (4) 0.95 mm
<b>89</b>	The life of lime concrete floor is taken as (1) 100 years (2) 80 years (3) 60 years (4) 20 years
<b>90</b>	The correction for sag is (1) always additive (2) always subtractive (3) always zero (4) sometimes additive and sometimes subtractive
<b>91</b>	In order to obtain the best workability of concrete, the preferred shape of aggregate is (1) rounded (2) elongated (3) angular (4) All of the above
<b>92</b>	According to IS:456-2000, the maximum reinforcement in a column is (1) 2% (2) 4% (3) 6% (4) 8%
<b>93</b>	At vena contracta jet has the minimum area of cross-section and so the velocity of liquid at this section will be (1) Minimum (2) Maximum (3) Average (4) Zero
<b>94</b>	A land is known as water logged (1) when the permanent wilting point is reached (2) when gravity drainage has ceased (3) capillary fringe reached the root zone of plants (4) None of the above
<b>95</b>	Soundness test of cement determines (1) quality of free lime (2) ultimate strength (3) durability (4) initial setting
<b>96</b>	The post-tender stage of construction consists of (1) assessment of work (2) finalisation of accounts (3) assessment of expenditure during execution (4) all of the above

<b>97</b>	One kg force is equal to (1) 7.8N      (2) 8.9N      (3) 9.8N      (4) 12N
<b>98</b>	For 5000 bricks in 1 : 2 cement mortar the cubic meters of sand required would be (1) 1.0      (2) 2.0      (3) 4.0      (4) 5.5
<b>99</b>	Excess of silica in brick earth causes (1) Loss of cohesion      (2) Impermeability (3) Cracking and warping on drying      (4) Brittleness
<b>100</b>	The under surface of a stair is called (1) Waiste      (2) Soffit      (3) Ceiling      (4) None of the above