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मध्यप्रदेश लोक सेवा आयोग
रेसीडेन्सी एरिया
इन्दौर

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राज्य अभियांत्रिकी सेवा प्रारंभिक परीक्षा –2017 प्रावधिक उत्तर कुंजी

–:: विज्ञप्ति ::–

आयोग के विज्ञापन क्रमांक–03 / परीक्षा / 2017 दिनांक 08.03.2017 के अतर्गत आयोजित राज्य अभियांत्रिकी सेवा प्रारभिक परीक्षा –2017 के प्रथम प्रश्न पत्र– सामान्य अभियोग्यता एव द्वितीय प्रश्न पत्र के विषय– सिविल इंजीनियरिंग, मेकेनिकल इंजीनियरिंग एव इलेक्ट्रिकल इजीनियरिंग की परीक्षा दिनांक–16.07.2017 के वस्तुनिष्ठ प्रकार के प्रश्न पत्रों की प्रावधिक उत्तर कुंजी परीक्षा परिणाम बनाने के पूर्व आयोग की वेबसाईट पर प्रकाशित की जा रही है। अभ्यर्थी आयोग की वेबसाईट पर अपना रोल नंबर एव प्रवेश पत्र पर दिये गये पासवर्ड की सहायता से लॉग–इन कर अपनी रिस्पांस शीट का अवलोकन कर सकते हैं। यदि इस प्रावधिक उत्तर कुजी के सबध मे किसी परीक्षार्थियों को कोई आपत्ति हो तो वे ऑनलाईन आपत्तियां 07 दिवस के अन्दर प्रस्तुत कर सकते हैं। इस हेतु अभ्यर्थी प्रश्न क्रमांक, सदर्भ ग्रंथो का नाम एवं दस्तावेज सलग्न करें। प्रावधिक उत्तर कुंजी आयोग की वेबसाईट पर अपलोड होने की तिथि से 07 दिवस की समयावधि के पश्चात प्राप्त आपत्तियों पर विचार नहीं किया जायेगा। यह विज्ञप्ति आयोग की वेबसाईट www.mppsc.com & www.mppsc.nic.in, www.mppscdemo.in पर दिनांक 16.07.2017 से उपलब्ध है।

(डॉ एम.एल. गोखरू(जैन)
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State Engineering Services Exam - 2017

(Model Answer Key)

Civil Engineering

Q1 : As per the Indian Standard (IS) 456 : 2000, if f_{ck} is the characteristic strength of concrete, the tensile strength of the concrete is

A	$0.7\sqrt{f_{ck}}$
B	$0.5\sqrt{f_{ck}}$
C	$0.87\sqrt{f_{ck}}$
D	$0.46\sqrt{f_{ck}}$

Answer Key: **A**

Q2 : Maximum depth of neutral axis for singly reinforced beam with Fe500 is (here, depth of the beam = d)

A	0.44 d
B	0.46 d
C	0.48 d
D	0.53 d

Answer Key: **B**

Q3 : The minimum area of steel required per meter length of a slab with overall depth of 100 mm consisting of steel grade Fe500 is

A	96 mm^2
B	150 mm^2
C	120 mm^2
D	Insufficient data

Answer Key: **C**

Q4 : For a square reinforced concrete (RC) column with cross-section of 300 mm x 300 mm having an effective length of 2500 mm, determine the minimum eccentricity

A	15 mm
B	30 mm
C	20 mm
D	None of these

Answer Key: **C**

Q5 : Determine the plan area of a footing carrying load of 1500 kN from 300 mm square column containing 20 mm diameter bars as longitudinal steel. The safe bearing capacity of the soil is 120 kN/ m^2.

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A	12.5 m^2
B	8.33 m^2
C	12.63 m^2
D	14.38 m^2

Answer Key: **A**

Q6 : The permissible stress in steal (σ_{st}) is 130 MPa in a water tank of diameter 1.3 m which is designed to resist direct tensile force (T) of 260 kN per meter width. Determine the required area of tension steel in mm^2/m.

A	500
B	2000
C	33800
D	2 x 10^9

Answer Key: **B**

Q7 : Determine the volume of a 5m diameter bunker to store 50 tonnes of coal having density of $10kN/m^3$

A	5 m^3
B	20 m^3
C	50 m^3
D	500 m^3

Answer Key: **C**

Q8 : In which one of the following post-tensioning anchorage systems, the high-tension bars are threaded at their ends?

A	Gifford-Udall
B	Freyssinet
C	Lee-McCall
D	Magnel-Blaton

Answer Key: **C**

Q9 : As per the Indian Standard (IS) 800 : 2007, a maximum effective slenderness ratio for member carrying compressive loads resulting from dead loads and imposed loads

A	250
B	300
C	180
D	350

Answer Key: **C**

Q10 A solid steel plate having ultimate strength of 410 MPa, the design strength in rupture (N/mm^2) is

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:	
A	250
B	295.2
C	335.45
D	410
Answer Key: **B**	

Q11 :	A steel plate of size 250 mm x 150 mm x 10mm with holes for two number of 16 mm diameter bolts having ultimate strength of 410 MPa, the design strength of plate in rupture of critical section is
A	336 kN
B	382 kN
C	365 kN
D	280 kN
Answer Key: **A**	

Q12 :	A compression member having gross and effective cross-sectional areas of 1500 mm^2 and 1250 mm^2, respectively. If the design compressive stress is 150 MPa, the design compressive strength of the column will be
A	8.33 kN
B	10 kN
C	188 kN
D	225 kN
Answer Key: **C**	

Q13 :	A uniform beam of length 6m carries ultimate load of 20 kN/m inclusive of self-weight, the design shear force is
A	120 kN
B	90 kN
C	60 kN
D	30 kN
Answer Key: **C**	

Q14 :	In the design of a plate girder, the outstand of web stiffener from the face of the web is restricted to (thickness of stiffener = t_q; and yield stress ratio = ε)
A	12 $t_q\varepsilon$
B	14 $t_q\varepsilon$
C	16 $t_q\varepsilon$
D	20 $t_q\varepsilon$
Answer Key: **D**	

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Q15:	To prevent buckling of the top edge of a gusset plate due to bending compression, the outstand of the gusset plate from the edge of column should be limited to (thickness of plate = t; yield stress ratio = ε)
A	9.40 $t\varepsilon$
B	8.40 $t\varepsilon$
C	13.6 $t\varepsilon$
D	29.3 $t\varepsilon$
Answer Key: **C**	

Q16:	In roof truss purlins, the sag rods are designed as
A	Compression members
B	Laterally supported beams
C	Laterally unsupported beams
D	Tension members
Answer Key: **D**	

Q17:	Wind load on steel roof truss for an industrial building will depend on
A	Location of the structure
B	Height of the structure
C	Shape of the structure
D	All of these
Answer Key: **D**	

Q18:	A fixed beam of length L is subjected to concentrated load W at mid-span, the collapse load is (plastic moment = M_p; length of beam = L)
A	$6M_p/L$
B	$8M_p/L$
C	$16M_p/L$
D	$4M_p/L$
Answer Key: **B**	

Q19:	The values of displacements in {D} necessary to ensure the equilibrium of the joints are determined using the relation (displacement vector={D}; stiffness matrix =[K]; and load vector ={P})
A	{P}+[K]{D} =0
B	{D}+[K]{P} =0
C	{P}{D}+[K] =0
D	[K]{P}=0

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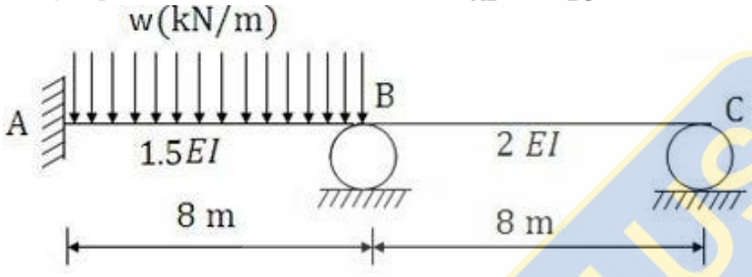
Answer Key: **A**

Q20 : In the flexibility matrix method of analysis, the values of redundant forces necessary to ensure geometric continuity of structure are determined by using relation (displacement at release due to applied loading = D_p; flexibility matrix = F; redundant forces on released structure =X_R)

A	$[F]+\{D_p\}\{X_R\}=0$
B	$\{D_p\}+[F]\{X_R\}=0$
C	$\{X_R\}+[F]\{D_p\}=0$
D	$[F]\{D_p\}=0$

Answer Key: **B**

Q21 : Using slope-deflection method, the stiffness K_{AB} and K_{BC} of a beam shown below respectively are



A	$\frac{1.5\,EI}{8}$ and $\frac{2\,EI}{8}$
B	$\frac{EI}{2}$ and $\frac{3\,EI}{8}$
C	$\frac{3\,EI}{8}$ and $\frac{EI}{2}$
D	$\frac{1.5\,EI}{8}$ and $\frac{EI}{4}$

Answer Key: **C**

Q22 : The strain energy due to torsion is (torsion = T; modulus of elasticity = E; moment of inertia = I; shear modulus = G; polar moment of area = J)

A	$\int \frac{T^2\,dx}{2EI}$
B	$\int \frac{T^2\,dx}{2GJ}$
C	$\int \frac{T\,dx}{2EI}$
D	$\int \frac{T\,dx}{2GJ}$

Answer Key: **B**

Q23 : In two-hinged arch, how many unknown forces exist?

A	One unknown

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B	Two unknowns
C	Three unknowns
D	Four unknowns
Answer Key: **D**	

Q24 :	The area under β - distribution curve is divided into two equal parts by
A	Most likely time
B	Expected time
C	Optimistic time
D	Pessimistic time
Answer Key: **B**	

Q25 :	Select the incorrect statement.
A	Earliest start of an activity is the early event time of the node it leaves
B	Latest finish of an activity is the late event time of the node it enters
C	Latest start of an activity is its latest finish minus its duration
D	Earliest finish of an activity is the late event time of the node it enters minus its duration
Answer Key: **D**	

Q26 : Which of the following activity is non-critical in the project given in the table below?

Activity	Predecessor	Duration	Cost slope	Workers/day
P	--	3	20	5
Q	--	4	30	4
R	P	4	25	4
S	P,Q	3	25	5
T	R	3	15	5
U	R,S	4	55	4

A	P
B	R
C	T
D	U
Answer Key: **C**	

Q27 :	There are three parallel paths in a part of a network between a bursting node and the next merging node with only one activity in each path. The minimum number of dummy arrows needed will be
A	Zero
B	1
C	2
D	3

Answer Key: **C**

Q28: Among the following excavators, the most suitable excavator for hard digging above track level will be

A	Back hoe
B	Front shovel
C	Scraper
D	Dragline

Answer Key: **B**

Q29: Vibrating compactor is ideally suited for

A	Manual towing and compacting any type of soil with varying moisture content
B	Compacting fly ash masses with any moisture content
C	Compacting cohesionless granular material with any moisture content
D	Compacting all fine grained materials having adequate moisture content

Answer Key: **C**

Q30: Site order book is used for recording

A	Instructions of the executive engineer
B	Construction measurements
C	Requisition of plants and equipments
D	Indents for materials to be ordered

Answer Key: **A**

Q31: Sensitivity analysis is a study of

A	Comparison of profit and loss
B	Comparison of assets and liabilities
C	Change in output due to change in input
D	Economics of cost and benefits of the project

Answer Key: **C**

Q32: If the excavation of earth is done manually then it costs Rs. 100 per cum. A machine can excavate at a fixed cost of Rs. 40,000 plus a variable cost Rs. 20 per cum. The quantity of the earth for which the cost of excavation by machine will be equal to the cost of excavation by machine will be equal to the cost by manual excavation is

A	500 cum
B	1000 cum
C	1500 cum

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D	2000 cum

Answer Key: **A**

Q33 :	While assessing rate of return on certain investments, the investor assumes certain interest rate and calculates his net present value of all his cash inflows and outflows. Which of following will be correct?
A	If net present value is positive for the assumed value of interest rate, the actual rate of return will be higher than assumed interest rate
B	If net present value is positive for the assumed value of interest rate, the actual rate of return will be lower than the assumed interest rate
C	It cannot be assessed in the absence of cost of capital
D	It cannot be assessed in the absence of actual loan period

Answer Key: **A**

Q34 :	The system of organization introduced by F.W. Taylor is known as
A	Effective organization
B	Functional organization
C	Line and staff organization
D	Line organization

Answer Key: **B**

Q35 :	Liquidated damage refers to
A	Damages of walls , plasters and paints due to gushing of liquid or rain
B	Penalty cost to rectify dampness in the buildings arising out of gushing of liquid or rain
C	Penalty cost to rectify sub- standard quality of work
D	Penalty for delaying the work beyond agreed date

Answer Key: **D**

Q36 :	A stream having wetted area (A) of 500 m^2 and wetted perimeter (P) of 150 m, the hydraulic mean radius in meter is
A	650
B	3.33
C	0.3
D	350

Answer Key: **B**

Q37 :	Look at the following information for a completely mixed biological reactor: tank volume = 200 m^3; flow rate = 50 m^3/day ; incoming substrate concentration = 95 mg BOD_5/L. Calculate effluent BOD_5 (Given K_s = 60 mg BOD_5 /L ; k_d = 0.06/day; μ_m = 3 /day)
A	6.92 mg/L

B	6.80 mg/L
C	7.0 mg/L
D	7.2 mg/L
Answer Key: **A**	

Q38 :	Ground water contaminated with TCE is treated with powdered activated carbon by sorption (isotherm : $Q_{eq} = 129(C_{eq})^{0.73}$ where Q_{eq} is mass of TCE adsorbed on PAC (mg/mg PAC); C_{eq} is concentration of dissolved TCE in water (mg/L)). If TCE concentration in water is 1 mg /L, what mass concentration of PAC must be used (mg PAC/L water) to reduce TCE concentration to 0.005 mg /L?
A	0.3690 mg /L
B	0.45 mg /L
C	0.35 mg /L
D	0.40 mg /L
Answer Key: **A**	

Q39 :	A filter bed is composed of 12 inches of uniform anthracite with an average size of 1.6 mm for a filtration rate of 4 gal/ft^2/min (or 160 L/min/m^2) (temperature is 20^{o}C; particle shape factor: 0.50; kinematic viscosity: 1.091 x 10^{-5} ft^2/s). Calculate Reynolds number ?
A	2.0
B	2.15
C	2.3
D	3.0
Answer Key: **B**	

Q40 :	A solution has 100 mg/L ammonium ions. Calculate amount of oxygen required for converting to nitrate ions.
A	355 mg/L
B	400 mg/L
C	440 mg/L
D	430 mg/L
Answer Key: **A**	

Q41 :	Uniformity co-efficient of filter sand is given by
A	D_{50} /D_5
B	D_{50}/D_{10}
C	D_{60}/D_5
D	D_{60}/D_{10}
Answer Key: **D**	

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Q42 :	One liter of sewage, when allowed to settle for 30 minutes gives a sludge volume of 27 cm^3 . If the dry weight of this sludge is 3.0 grams, then its sludge volume index will be
A	9
B	24
C	30
D	81
Answer Key: **A**	

Q43 :	Calculate amount of oxygen required for reacting with two moles of ammonium ions for converting to nitrate ions.
A	4 moles
B	3 moles
C	2 moles
D	1 mole
Answer Key: **A**	

Q44 :	Calculate R-log removal value for 99.0% removal.
A	2
B	1.5
C	3
D	1
Answer Key: **A**	

Q45 :	What is the percentage of remaining pathogen concentration at 99% removal after 5 minutes of contact time during chlorination? (Assume K = 0.06/min)
A	70%
B	66%
C	74.08%
D	65%
Answer Key: **C**	

Q46 :	An experiment shows that a concentration of 0.1 mg /L of HOCl yield an 89% killing of bacteria in 5 minutes . Calculate disinfection rate constant. Assume that Chick's Law and Watson's Law hold.
A	0.3/min
B	0.366/min
C	0.4416/min
D	0.40/min

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Answer Key: **C**

Q47 : For the following information (Equation of isotherm of Anthracene on alumina: $Q = [22C_t] / [1+35\ C_t]$ where Q is mol Anthracene/kg alumina; C_t = mol Anthracene /L Liquid), calculate remaining Anthracene concentration (mol /L) for 0.1 mol /kg adsorption capacity ?

A	0.00054 mol/L
B	0.0054 mol/L
C	0.02 mol/L
D	0.054 mol/L

Answer Key: **B**

Q48 : The chloride content of treated water for public supplies should not exceed

A	100 ppm
B	150 ppm
C	200 ppm
D	250 ppm

Answer Key: **D**

Q49 : Look at the chlorine residual data during chlorination of waste water which consist of ammonia, organic matter and microorganisms.

Chlorine dosage (mg/L)	0.1	0.5	1.0	1.5	2.0	2.5
Chlorine residual (mg/L)	0.0	0.4	0.8	0.4	0.9	1.4

Calculate chlorine dose at breakthrough point

A	0.5 mg/L
B	1.5 mg/L
C	2.0 mg/L
D	10 mg/L

Answer Key: **B**

Q50 : Select the correct sequence of different phases of biomass curve:

A	Lag phase → Log growth phase → stationery phase → endogenous phase
B	Lag phase → endogenous phase → stationery phase → log growth phase
C	Endogenous phase → Lag phase → stationery phase → Log growth phase
D	Log growth phase → Lag phase → endogenous phase → stationery phase

Answer Key: **A**

Q51 : Order 4 solutions in increasing order of their BOD values

A	Industrial water < river water < tap water < bottled water

B	Tap water < bottled water < river water < industrial water
C	Bottled water < river water < tap water < industrial water
D	Bottled water < tap water < river water < industrial water
Answer Key: **D**	

Q52 :	Coal based thermal power stations pollute the atmosphere by adding
A	NO_X and SO_2
B	NO_X , SO_2 and SPM
C	NO_X , SO_2 , SPM and CO
D	NO_X , SPM and CO
Answer Key: **B**	

Q53 :	Which one of the following expresses the degree of disturbance of undisturbed clay sample due to remolding?
A	Thixotropy
B	Dilatancy
C	Sensitivity
D	Plasticity
Answer Key: **C**	

Q54 :	Given the coefficient of curvature = 1.4, D_{30} = 3 mm, D_{10} = 0.6 mm. Based on this information of particle size distribution for use as sub grade, this soil is classified as
A	Uniformly - graded sand
B	Well - graded sand
C	Very find sand
D	Poorly - graded sand
Answer Key: **B**	

Q55 :	In laboratory compaction tests, the optimum moisture content of soil decreases
A	With increase of compaction energy and with decrease of coarse grains in the soil
B	With decrease of compaction energy and with increase of coarse grains in the soil
C	With increase of both compaction energy and coarse grains in the soil
D	With decrease of both compaction energy and coarse grains in the soil
Answer Key: **C**	

Q56 :	To provide safety against piping failure, with a factor of safety of 5, what should be the maximum permissible exit gradient for soil with specific gravity of 2.5 and porosity of 0.35?

A	0.176
B	0.195
C	0.882
D	0.980

Answer Key: **B**

Q57 : From a flownet which of the following information can be obtained?
1. Rate of flow
2. Pore water pressure
3. Exit gradient
4. Permeability

Select the correct answer using the codes given below:

A	1,2,3 and 4
B	1,2 and 3
C	2,3 and 4 only
D	1 only

Answer Key: **B**

Q58 : The initial and final void ratios of a clay sample in a consolidation test are 1 and 0.5, respectively. If the initial thickness of the sample is 2.4 cm, then its final thickness will be

A	0.6 cm
B	0.9 cm
C	1.2 cm
D	1.8 cm

Answer Key: **D**

Q59 : If Δp is increment of pressure on a normally consolidated saturated soil mass, as per Terzaghi's theory at the instant of application of pressure increment i.e., When time t =0, what is the pore pressure developed in the soil mass?

A	Zero
B	Very much less than Δp
C	Equal to Δp
D	Greater than Δp

Answer Key: **C**

Q60 : Which one of the following pairs is not correctly matched?

A	Critical void ratio - Rapid draw down
B	Swedish arc - Stability of slopes
C	Critical height - Stability number
D	Base failure - Soft clay

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Answer Key: **A**

Q61: Consider the following statements:
1. Dynamic cone penetration test for site investigation is based on the principle that elastic shock waves travel in different materials at different velocities.
2. Electrical resistivity method of subsurface investigation is capable of detecting only the strata having different electrical resistivity.
3. In-situ vane shear test is useful for determining the shear strength of very soft soil and sensitive clays and is unsuitable for sandy soil.
Which of these statements is/are correct?

A	1 and 2
B	2 and 3
C	1 and 3
D	2 alone

Answer Key: **B**

Q62: During a sampling operation, the drive sampler is advanced 600 mm and the length of the sample recovered is 525 mm. What is the recovery ratio of the sample?

A	0.125
B	1.140
C	0.143
D	0.875

Answer Key: **D**

Q63: A consolidated drained triaxial test was conducted on a granular soil. At failure $\frac{\sigma_1}{\sigma_3} = 4.6$, the value of '$\emptyset$ ' of the soil is

A	40^o
B	45^o
C	53^o
D	65^o

Answer Key: **A**

Q64: Given that for a soil deposit, K_o = earth pressure coefficient at rest; K_a = active earth pressure coefficient; K_p = passive earth pressure coefficient; μ = Poisson's ratio. The value of $(1-\mu)/\mu$ is given by

A	K_a/K_p
B	K_o/K_a
C	K_p/K_a
D	$1/K_o$

Answer Key: **D**

Q65: A vertical cut is to be made in a saturated and submerged clay with c = 15 kN/m^2 , γ_{sat} = 18.5 kN/m^3 , and γ_w = 10 kN/m^3 . What is the theoretical depth to which the clay can be excavated without side collapse?

A	3.2 m
B	3.5 m
C	6.0 m
D	7.0 m

Answer Key: **D**

Q66 The minimum bearing capacity of a soil under a given footing occurs when the groundwater table at the location is at :

A	The base of the footing
B	The ground level
C	Depth equal to one-half the width of the footing
D	A depth equal to the width of the footing

Answer Key: **B**

Q67 In Terzaghi's bearing capacity analysis, the soil wedge immediately below the footing remains in state of :

A	Plastic equilibrium
B	Radial shear
C	Elastic equilibrium
D	Linear shear

Answer Key: **C**

Q68 A 30 cm diameter friction pile is embedded 10 m into a homogeneous consolidated deposit. Unit adhesion developed between clay and pile shaft is 4 t/m^2 and adhesion factor is 0.7. The safe load for factor of safety 2.5 is :

A	9.1 t
B	15.1 t
C	16.5 t
D	30.7 t

Answer Key: **B**

Q69 Hydrated lime $Ca(OH)_2$ can be effectively used for stabilization of :

A	Sandy soils
B	Silty soils
C	Plastic clayey soils
D	None of these

Answer Key: **C**

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Q70 : Which of the following is true in case of railway track maintenance?	
A	Shovel is used to lift rail while Rail tongs is used to handle ballast
B	Rail tongs is used to lift rail while Shovel is used to handle ballast
C	Shovel can be used to correct track alignment as well as to lift rail
D	Rail tongs can be used to handle ballast as well as to remove dog spikes
Answer Key: **B**	

Q71 : One degree of curve is equivalent to	
A	1600/R
B	1700/R
C	1720/R
D	1820/R
Answer Key: **C**	

Q72 : The number of sleepers used for rails varies from, Where 'n' length of rail in 'm'	
A	(n+1) to (n+4)
B	(n+3) to (n+6)
C	(n+2) to (n+7)
D	(n+4) to (n+8)
Answer Key: **B**	

Q73 : The reception signal is	
A	Advanced starter only
B	Starter only
C	None of the other options provided
D	Both Advanced starter and Starter
Answer Key: **C**	

Q74 : Runway threshold is indicated by series of parallel lines starting from a distance of	
A	3m from runway end
B	6m from runway end
C	10m from runway end
D	15m from runway end
Answer Key: **B**	

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Q75 :	As per ICAO, for airports serving big aircrafts, the crosswind component should not exceed
A	15 Kmph
B	25 Kmph
C	35 Kmph
D	45 Kmph
Answer Key: **C**	

Q76 :	Airport elevation is the reduced level above Mean Sea Level of
A	Control tower
B	Highest point of the landing area
C	Lowest point of the landing area
D	None of these
Answer Key: **B**	

Q77 :	Beaufort Scale is used to determine
A	Strength of winds
B	Direction of winds
C	Height of aircrafts
D	None of these
Answer Key: **A**	

Q78 :	The type of transition curves generally provided on hill roads, is
A	Circular
B	Cubic Parabola
C	Lemniscate
D	Spiral
Answer Key: **D**	

Q79 :	If x% is the gradient of an alignment and y% is the gradient after proper super elevation along a curved portion of a highway, the differential grade along the curve is,
A	(x+y)%
B	(x-y)%
C	(y-x)%
D	(y+x)%

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Answer Key: **C**

Q80 :	The maximum number of vehicles beyond which the rotary may not function effectively is
A	500 Vehicles per hour
B	500 Vehicles per day
C	5000 Vehicles per hour
D	5000 Vehicles per day

Answer Key: **C**

Q81 :	The diagram which shows all important physical conditions of an accident location like roadway limits, bridges, trees and all details of roadway conditions is known as
A	Pie Chart
B	Spot Maps
C	Condition Diagram
D	Collision Diagram

Answer Key: **C**

Q82 :	The increase in traffic Volume, due to the general increase in the number of transport Vehicles from year to year is known as,
A	Normal traffic growth
B	Generated traffic
C	Development traffic
D	Existing traffic

Answer Key: **A**

Q83 :	In hill roads, minimum sight distance required is
A	Stopping Sight Distance
B	Passing Sight Distance
C	Braking Distance
D	None of these

Answer Key: **A**

Q84 :	Hygroscopic water is defined
A	The water held by the soil under capillary action
B	The readily available water for the use of plants
C	The water which is absorbed by the particles of dry soil from the atmosphere
	Total water content of the soil filled with water

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D	

Answer Key: **C**

Q85 :	Pick up the correct sequence of the parts of a canal system
A	Main canal-distributary-branch canal-head works-minor
B	Head works-main canal-branch canal-distributary-minor
C	Head works-main canal-branch canal-minor-distributary
D	Head works-branch canal-main canal-distributary-minor

Answer Key: **B**

Q86 :	Small hydroelectric project generates power
A	< 25 MW
B	< 100 MW
C	< 550 MW
D	< 1000 MV

Answer Key: **A**

Q87 :	The ratio of the peak load to the installed capacity of the plant is known as
A	Load factor
B	Plant factor
C	Utilization factor
D	All the options are correct

Answer Key: **C**

Q88 :	For nine number rain gauge stations with an error of 10% in the estimation of mean of the rainfall, the coefficient of variation of rainfall Cv obtained as:
A	10
B	20
C	30
D	40

Answer Key: **C**

Q89 :	The shape of recession limb of a hydrograph depends upon
A	Basin characteristics only
B	Storm characteristics only
C	Both basin characteristics and storm characteristics

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D	None of these
Answer Key: **A**	

Q90 :	The most accurate method of finding the average depth of rainfall over an area is
A	Isohyetal method
B	Arithmetic mean method
C	Thiessen polygon method
D	All of these
Answer Key: **A**	

Q91 :	For a synthetic unit hydrograph the width of the unit hydrograph at 50% peak discharge is 87.5 h then the width of unit hydrograph in h at 75% peak discharge would be
A	10
B	30
C	50
D	100
Answer Key: **C**	

Q92 :	W-index will be always
A	Equal to ϕ-index
B	More than ϕ-index
C	Less than ϕ-index
D	A constant fraction of ϕ-index
Answer Key: **C**	

Q93 :	Hydrodynamic pressure due to earthquake acts at a height of, (where H is the depth of water)
A	3H/4π above the base
B	3H/4π below the water surface
C	4H/3π above the base
D	4H/3π below the water surface
Answer Key: **C**	

Q94 :	Select the correct statement
A	A meander increase the river length but a cut off reduces the river length
B	A cut-off increases the river length but a meander reduces the river length

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C	Both meander and cut-off increases the river length
D	Both meander and cut-off decrease the river length
Answer Key: **A**	

Q95 :	Select the incorrect statement
A	Intensive irrigation should be avoided in areas susceptible to water logging
B	Extensive irrigation should be adopted in areas susceptible to water logging
C	Lift irrigation increases water logging
D	All of these
Answer Key: **C**	

Q96 :	A divide wall is provided
A	At right angle to the axis of weir
B	Parallel to the axis of weir and upstream of it
C	Parallel to the axis of weir and downstream of it
D	At an inclination to the axis of weir
Answer Key: **A**	

Q97 :	The relationship between height (d) of the crest wall above the downstream bed level and the crest wall top (B) width for a rectangular Sarda fall is
A	$B = \sqrt{d}$
B	$B = 0.55\sqrt{d}$
C	$B = 1.55\sqrt{d}$
D	$B = 10.55\sqrt{d}$
Answer Key: **B**	

Q98 :	In case of non-availability of space due to topography, the most suitable spillway is
A	Straight drop spillway
B	Shaft spillway
C	Chute spillway
D	Ogee spillway
Answer Key: **B**	

Q99 :	For the upstream face of an earthen dam, the most adverse condition for the stability of slope is
A	Sudden drawdown

B	Steady seepage
C	During construction
D	Sloughing of slope
Answer Key: **A**	

Q100 :	If the coefficient of permeability and kinematic viscosity of water found as 4.17 cm/s and 0.01 cm^2/s respectively, then the intrinsic permeability in cm^2 would be
A	1.25×10^{-5}
B	4.25×10^{-5}
C	8.25×10^{-5}
D	12.25×10^{-5}
Answer Key: **B**	

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