University of Mumbai
Examination June 2021

Examinations Commencing from 1st June 2021

Program: **Civil Engineering**

Curriculum Scheme: Rev2012 (CBSGS)

Examination: BE Semester VIII

Course Code: CE-C801 and Course Name: Design & Drawing of Reinforced Concrete Structures

Time: 2 hour Max. Marks: 80

N. B. 1) Question No. 1 is compulsory**.**
2) Attempt any one sub question from question No. 2.
3) Attempt any two sub questions from question No. 3.
4) Use of relevant IS Code is permitted**.**
5) Assume suitable data if required and state it clearly.

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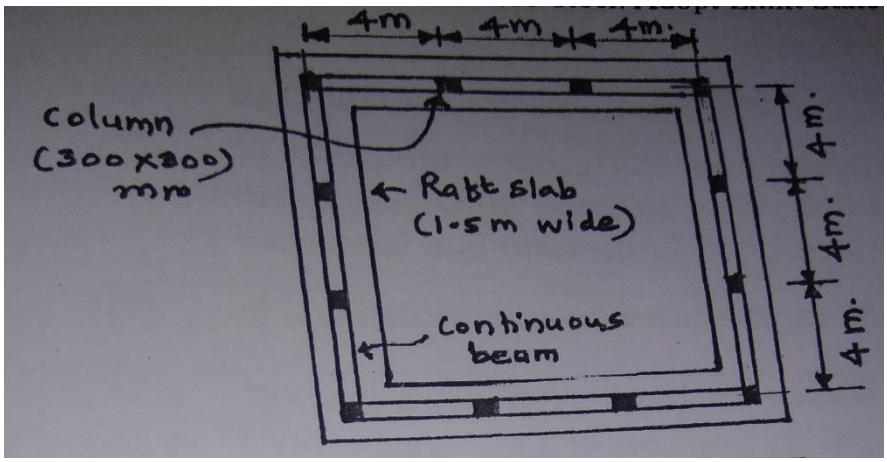
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks (Marks 40)**
1.	Which footing is provided when a number of column loads are supported by a single slab
Option A:	Combined footing
Option B:	Mats or rafts
Option C:	Deep footing
Option D:	Pile foundation
2.	What is the area of raft foundation if the total load transmitted to soil is 5280 KN and safe bearing capacity of soil is 120 KN/m²
Option A:	20 m²
Option B:	63 m²
Option C:	44 m²
Option D:	52 m²
3.	Total load of eight column on raft foundation is 5200 KN. Area of raft footing is 13 m x 5 m. Therefore intensity of net upword presure acting on footing is
Option A:	56 KN / m²
Option B:	59 KN / m²
Option C:	63 KN / m²
Option D:	80 KN / m²
4.	The vertical distance between the horizantal surfaces of two consecutive stair steps is called
Option A:	Rise
Option B:	Nosing
Option C:	Waist slab
Option D:	Winder
5.	Horizontal upper portion of a step in staircase is called
Option A:	Riser
Option B:	Landing

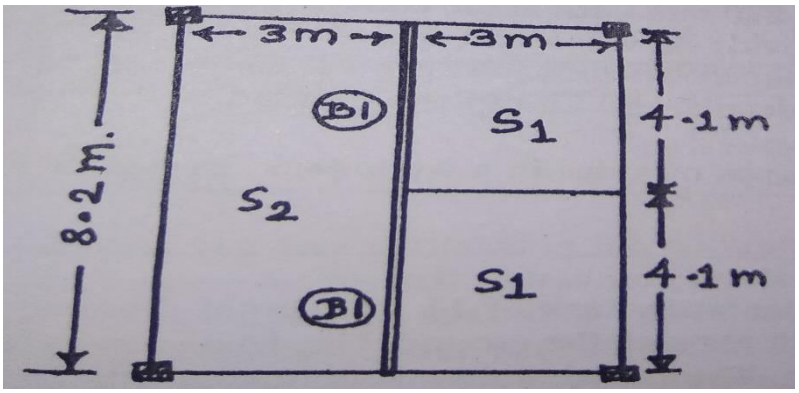
Option C:	Tread
Option D:	Flight
6.	If number of risers used in stair case are 12 in each flight, then number of treads in each flight are equal to
Option A:	13
Option B:	11
Option C:	10
Option D:	9
7.	Maximum bending moment per meter width of stair is 29538 Nm. Then its ultimate moment is equal to
Option A:	43567 Nm
Option B:	42309 Nm
Option C:	41000 Nm
Option D:	44307 Nm
8.	Staircase consist of 11 treads. Let tread of the steps be 270 mm then it's going is
Option A:	2.830 m
Option B:	2.20 m
Option C:	2.970 m
Option D:	3.115 m
9.	If the ratio of long span to short span of the slab is greater than two then this slab is called as
Option A:	Two-way slab
Option B:	One way slab
Option C:	Cantilever slab
Option D:	Continuous slab
10.	Area of main reinforcement steel in slab when Fe250 bars are used should not be less than --------- of the gross sectional area of slab
Option A:	0.30%
Option B:	0.20%
Option C:	0.12%
Option D:	0.15%
11.	In case of singly reinforced beam if xu / d is equal to the limiting value Xu max / d then the section is
Option A:	Over reinforced section
Option B:	Under reinforced section
Option C:	Balanced section
Option D:	Neutral section
12.	If area of main steel used in slab is 187.33 mm^2. What is the spacing of 8 mm diameter bar if effective depth of slab is 143 mm
Option A:	350 mm
Option B:	267 mm
Option C:	415 mm

Option D:	518 mm
13.	Toe slab is a part of
Option A:	Retaining wall
Option B:	Water tank
Option C:	Stair case
Option D:	Flat slab
14.	Counter fort retaining wall is designed when height of wall is above
Option A:	3 m
Option B:	9 m
Option C:	4 m
Option D:	6 m
15.	In case of cantilever retaining wall factors of safety against sliding should not be less than the following under most adverse combination
Option A:	3.4
Option B:	2.1
Option C:	1.4
Option D:	5.2
16.	A cantilever retaining wall has width of base slab 3 m. Distance of point of application of resultant force from the heel end is 1.813 m. Therefore, its eccentricity is
Option A:	0.6 m
Option B:	0.51 m
Option C:	0.313 m
Option D:	0.78 m
17.	Which I.S code is used for design of water tank
Option A:	IS 875
Option B:	IS 800
Option C:	SP 1600
Option D:	IS 3370
18.	Contraction joints are provided in interval of 7.5 meters at position of zero shear in water tank for
Option A:	Rigid joint
Option B:	Roof slab joint
Option C:	Vertical wall and base joint
Option D:	Inclined Joint
19.	What is the area of vertical distribution steel of a circular tank by IS code method if thickness of wall is 170 mm.
Option A:	510 mm^2
Option B:	620 mm^2
Option C:	850 mm^2
Option D:	763 mm^2

20.	What is the magnitude of maximum hoop tension by IS code method for a circular water tank 12 m diameter and 4 m high. The tank rest on firm ground. Wall of the tank restrained at the base, coefficient of hoop tension is equal to 0.569.
Option A:	112368 N
Option B:	115237 N
Option C:	133965 N
Option D:	101467 N

Q2 **(20 Marks)**	**Solve any One out of Two** *20 marks each*
A	Design a suitable raft slab connecting the columns of a building shown in figure. The columns are spaced at 4 m intervals. Service load transmitted by each column is 450 KN, column size is (300 mm x 300 mm). Soil SBC is 120 Mpa. Use M20 grade concrete and Fe415 steel. Adopt limit state method. 
B	Design a reinforced concrete cantilever retaining wall supporting a back fill of height 5.5 m above ground. Take density of soil = 18 KN/m³. Angle of repose = 30⁰. SBC of soil = 160 KN/m² and coefficient of friction between concrete and soil = 0.40. Grade of concrete is M25 and steel is Fe415.

Q3 **(20 Marks)**	**Solve any Two Questions out of Three** *10 marks each*
A	Design the part of an open well stair case the steps of flight AB have 150 mm bearing on the wall. The flight AB has a going of 1.5 m and landing slab of 1.5 m on either side of going. Thickness of the wall is 400 mm and width of steps is 1.5 m. Determine the loading on the flight AB if rise is 150 mm and tread is 250 mm. Adopt M20 concrete and Fe415 steel. Live load = 3 KN/m².
B	Explain with sketches various types of joints for water tanks.
C	Figure shows a part plan of the building. Slab (S1) has thickness of 120

	mm and slab (S2) has thickness of 140 mm. For the building, live load = 4 KN/m², floor finish = 1 KN/m². Beam B1 is 8.2 m long, 200 mm wide and 450 mm deep. Also beam B1 carries a masonry wall 115 mm thick and 3 m high, with masonry unit weight = 18 KN/m³. Calculate the factored (design) UDL carried by the beam (B1). Include the self-weight of the beam itself. 

University of Mumbai
Examination June 2021
Examinations Commencing from 1st June 2021
Program: Civil Engineering
Curriculum Scheme: Rev2016
Examination: BE Semester VIII (CBCGS)
Course Code: CEC801 and Course Name: Design & Drawing of Reinforced Concrete Structures
Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	If the ratio of long span to short span of the slab is greater than two then this slab is called as
Option A:	Two-way slab
Option B:	One way slab
Option C:	Cantilever slab
Option D:	Continuous slab
2.	In case of singly reinforced beam if Xu / d is equal to the limiting value Xu max / d then the section is
Option A:	Over reinforced section
Option B:	Under reinforced section
Option C:	Balanced section
Option D:	Neutral section
3.	If area of main steel used in slab is 187.33 mm^2. What is the spacing of 8 mm diameter bar if effective depth of slab is 143 mm
Option A:	350 mm
Option B:	267 mm
Option C:	415 mm
Option D:	518 mm
4.	What is the moment of resistance of singly reinforced concrete beam of 200 mm width and 400 mm effective depth. Take M20 concrete and Fe415 steel. Let Xu max / d = 0.479
Option A:	59.26 KNm
Option B:	53.56 KNm
Option C:	75.21 KNm
Option D:	88.37 KNm
5.	Horizontal upper portion of a step-in staircase is called
Option A:	Riser
Option B:	Landing
Option C:	Tread
Option D:	Flight
6.	If number of risers used in stair case are 12 in each flight, then number of treads

	in each flight are equal to
Option A:	13
Option B:	11
Option C:	10
Option D:	9
7.	Minimum percentage of distribution steel used in stair case is ----- of gross cross-sectional area of waist slab (steel fe415 grade)
Option A:	0.15%
Option B:	0.20%
Option C:	0.30%
Option D:	0.12%
8.	What is the area of distribution steel per meter width of stair case, if thickness of waist slab is 220 mm (steel Fe415 grade)
Option A:	225 mm^2
Option B:	320 mm^2
Option C:	264 mm^2
Option D:	210 mm^2
9.	Toe slab is a part of
Option A:	Retaining wall
Option B:	Water tank
Option C:	Stair case
Option D:	Flat slab
10.	Counter fort retaining wall is designed when height of wall is above
Option A:	3 m
Option B:	9 m
Option C:	4 m
Option D:	6 m
11.	A cantilever retaining wall has width of base slab 3 m. Distance of point of application of resultant force from the heel end is 1.813 m. Therefore, its eccentricity is
Option A:	0.6 m
Option B:	0.51 m
Option C:	0.313 m
Option D:	0.78 m
12.	Which I.S code is used for design of water tank
Option A:	IS 875
Option B:	IS 800
Option C:	SP 16
Option D:	IS 3370
13.	Which type of joint in water tank is provided to serve as a continuity between first cast concrete and second cast concrete
Option A:	Rigid joint

Option B:	Vertical joint
Option C:	Roof slab joint
Option D:	Horizontal contraction joint
14.	What is the area of vertical distribution steel of a circular tank by IS code method if thickness of wall is 170 mm.
Option A:	510 mm^2
Option B:	620 mm^2
Option C:	850 mm^2
Option D:	763 mm^2
15.	Lap splices shall not be provided at
Option A:	Within a joint
Option B:	At mid span
Option C:	Long span
Option D:	Within a distance of 5d from the face of joint
16.	The capacity of structure or its member is the capacity to undergo large in-elastic deformations without significant loss of strength or stiffness is called
Option A:	Response
Option B:	Ductility
Option C:	Importance factor
Option D:	Durability
17.	When column terminate into a footing or mat special confining reinforcement shall extend at least ---------- mm into the footing or mat
Option A:	110 mm
Option B:	300 mm
Option C:	200 mm
Option D:	500 mm
18.	A method of pre stressing concrete in which the tendons are tensioned before the concrete is placed is called
Option A:	Pre tensioning
Option B:	Post tensioning
Option C:	Tendon
Option D:	Debonding
19.	Freyssinet system is based on the principle of
Option A:	Direct bearing on concrete from bolt head at the end of wire
Option B:	Looping of wires around concrete
Option C:	Wedge action producing frictional grip between steel and concrete
Option D:	Long span tendons
20.	Loss of stress due to elastic deformation of concrete depends upon
Option A:	Relaxation of steel
Option B:	Friction and anchorage slip
Option C:	Modular ratio
Option D:	Shrinkage of concrete

Q2 **(20 Marks)**	**Solve any One out of Two** **20 marks each**
A	Design a 4 m x 6 m interior panel of a two-way continuous slab for a live load of 3000 N/m². Use M20 concrete and Fe415 steel. Draw net sketch showing reinforcement details.
B	Design a reinforced concrete cantilever type retaining wall having 5 m tall stem. The wall retains soil level with its top. The soil weighs 18000 N/m³ and has an angle of repose 30°. The safe bearing capacity of the soil is 200 KN/m². Use M20 concrete and Fe415 steel. Draw net sketch showing reinforcement details.

Q3. **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	Design the part of an open well stair case the steps of flight AB have 150 mm bearing on the wall. The flight AB has a going of 1.5 m and landing slab of 1.5 m on either side of going. Thickness of the wall is 400 mm and width of steps is 1.5 m. Determine the loading on the flight AB if rise is 150 mm and tread is 250 mm. Adopt M20 concrete and Fe415 steel. Live load = 3 KN/m². Draw net sketch showing reinforcement details.
B	Design a circular water tank 12 m diameter and 4 m high by I. S. Code method. The tank rest on firm ground. The wall of tanks have flexible joints at the base . Use M30 concrete & Fe415 steel. Take unit weight of water as 9.81 kN/m^3. Permissible stress in concrete in compression due to bending is 10 MPa & permissible stress in steel is 130 MPa. Permissible stress in concrete under direct tension is 1.5 MPa. Draw net sketch showing reinforcement details.
C	Write short note on
I	Factors affecting ductility
Ii	Freyssinet system of post tensioning

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University of Mumbai
Examination June 2021
Examinations Commencing from 1st June 2021
Program: **_CIVIL ENGINEERING**
Curriculum Scheme: Rev 2012
Examination: BE Semester VIII

Course Code: CEC-802 Course Name:Construction Engineering
Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Special equipments are the one which
Option A:	Are used for jobs like offshore construction,tunneling,etc.
Option B:	Can be operated by unskilled labour
Option C:	Are easily available at a cheap cost
Option D:	Can be easily repaired as their spareparts are easily available
2.	Vaccum concrete is widely used for construction of
Option A:	Bridges.
Option B:	Retaining wall
Option C:	Industrial flooring
Option D:	Shear walls
3.	Balancing of equipments means
Option A:	Supporting the equipments on a sound foundation.
Option B:	Optimum utilisation of equipments involved in a construction process
Option C:	Keeping the equipments idle for maximum time.
Option D:	Keeping the equipments busy for maximum time.
4.	Concrete used to construct walls of nuclear reactor should have higher
Option A:	permeability
Option B:	density
Option C:	porosity
Option D:	Specific gravity
5.	Poor tremie concreting can result in
Option A:	slurry pockets getting entrapped within the diaphragm wall concrete
Option B:	better quality work due to trapped air. .
Option C:	lot of savings and profit to the contractor
Option D:	enhanced strength resulting in improved durability
6.	Dozer is a
Option A:	Pumping equipment.
Option B:	Stone crushing equipment.
Option C:	Earthmoving equipment.
Option D:	Pile driving equipment.

7.	Jack hammer is a
Option A:	Pumping equipment.
Option B:	Stone crushing equipment.
Option C:	Earthmoving equipment.
Option D:	Drilling equipment
8.	The most suitable method for tunneling in hard rock is
Option A:	Drilling and blasting method
Option B:	NATM
Option C:	Forepoling method
Option D:	Needle Beam method.
9.	Mucking is the process of
Option A:	Shaping the tunnel in the desired shape
Option B:	Drilling holes into the hard rock
Option C:	Removal of debris out of the tunnel cross-section.
Option D:	Filling explosives in the drilled holes
10.	Which one of the following is not a type of pump?
Option A:	Centrifugal
Option B:	Reciprocating
Option C:	Drifter
Option D:	Diaphragm
11.	Sand drain is a technique used for
Option A:	Pile driving
Option B:	Soil stabilization
Option C:	Blasting
Option D:	Drilling
12.	One of the following is not a method of bridge construction
Option A:	Balanced cantilever
Option B:	Incremental launching
Option C:	Cast-in –situ
Option D:	Full face method
13.	Forklift is an equipment used for
Option A:	Stone crushing
Option B:	Moving earth
Option C:	Moving materials
Option D:	Moving fluids
14.	Hammer mill is a
Option A:	Pile driving equipment
Option B:	Drilling equipment
Option C:	Blasting equipment
Option D:	Stone crushing equipment
15.	One of the following is not a method of tunnel lining
Option A:	Lining trolley

Option B:	Pumpcrete method
Option C:	Well point system
Option D:	Pneumatic placer
16.	The process of using composite materials to fill up voids, seal joints and reinforce existing structures is called
Option A:	compacting
Option B:	grouting
Option C:	skirting
Option D:	distorting
17.	The equipment not required for moving earth is
Option A:	Clamshell
Option B:	Dragline
Option C:	Hammermill
Option D:	Scraper
18.	Diaphragm wall is constructed for
Option A:	The purpose of cladding
Option B:	Soil stabilization
Option C:	Acting as a separator
Option D:	Taking the load of road/railway constructed on its top.
19.	Major concern in mass concreting is
Option A:	Huge amount of concreting is to be done in a relatively smaller area.
Option B:	Its huge requirement of cement.
Option C:	Its huge requirement of materials.
Option D:	Huge amount of heat of hydration given out.
20.	The drill holes which are kept empty are called
Option A:	Rim holes
Option B:	Relaxer holes
Option C:	Reliever holes
Option D:	Relief holes

Q2 **Solve any four Questions out of Six (Each question carries 05 marks)** **20**

a State the various factors to be considered while selecting a construction equipment.
b Explain the working of reciprocating pump.
c Explain the care to be taken while transporting, handling & storage of explosives.
d State the applications of air compressors in Civil Engineering.
e Describe any two methods of permanent ventilation of tunnels.
f Write a detailed note on Jaw crushers

Q3 **Solve any Two Questions out of Three (Each question carries 10 marks)** **20**

a Compare incremental launching & balanced cantilever method of bridge construction.
b Explain Tunnel boring machine with respect to components and working of the same.
c Compare standard and special equipments (05 points each)

University of Mumbai

Examination: - June 2021

Examinations Commencing from 1 June 2021

Program: 1T00628 / / B.E (Civil Engineering) (SEM-VIII)

(Choice Base Credit Grading System) (R2016)

Curriculum Scheme: Rev - 2016

Examination: BE Semester VIII

Course Code: CEC802 and Course Name: Construction Management

Time: 2hours Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Order in which various stages of Construction Project is carried out is
Option A:	Conceptual stage – Analysis and Design Stage – Tender and Contract Stage – Construction Stage
Option B:	Conceptual stage – Tender and Contract Stage -Analysis and Design Stage – Construction Stage
Option C:	Analysis and Design Stage – Tender and Contract Stage – Construction Stage - Conceptual stage
Option D:	Tender and Contract Stage – Conceptual stage – Analysis and Design Stage – Construction Stage
2.	Who had introduced bar chart?
Option A:	Henry Fayol
Option B:	F. W. Taylor
Option C:	Henry Gantt
Option D:	Elton Mayo
3.	Which activity has negative float?
Option A:	sub-critical activity
Option B:	critical activity
Option C:	super-critical activity
Option D:	normal activity
4.	What is ABC analysis?
Option A:	Manufacturing Process
Option B:	Quantitative Method
Option C:	Inventory Control Technique
Option D:	Quality Control Technique
5.	What is Cost slope?
Option A:	Cost required to crash the activity by unit time
Option B:	Time required to crash the activity
Option C:	Cost required to complete the activity in minimum time
Option D:	Cost required for the activity
6.	Act of guiding, overseeing and leading people comes under the management function

	of
Option A:	controlling
Option B:	Planning,
Option C:	organizing
Option D:	Directing
7.	Construction is classified as belonging to MINOR works if the amount of contract is
Option A:	Less than 50 thousand
Option B:	More than 1 Lakh
Option C:	More than 50 thousand
Option D:	Less than 1 Lakh
8.	The inter relationship between the functional elements of programme is achieved through which technique?
Option A:	Pie Chart
Option B:	bar charts
Option C:	work break down structure
Option D:	A-B-C analysis
9.	What is the process of incorporating changes and rescheduling or replanning called?
Option A:	Resource smoothing
Option B:	Updating
Option C:	Resource leveling
Option D:	Resource allocation
10.	In which Year,' Minimum Wages Act' was introduced?
Option A:	1948
Option B:	1923
Option C:	1945
Option D:	1936
11.	How many principles of management told by Mr. Henry Fayol?
Option A:	07
Option B:	12
Option C:	14
Option D:	10
12.	What is Variance?
Option A:	Sum of time duration of various job/no of jobs
Option B:	Difference between time under consideration and mean time
Option C:	Square root of mean of standard deviation
Option D:	Mean of squared deviation
13.	What is EOQ?
Option A:	Environmental Order Quality
Option B:	Economic Order Quantity
Option C:	Ecological Order Quantity
Option D:	Ecological Order Quality
14.	Who had discovered Critical Path Method?

Option A:	F. W. Taylor
Option B:	Henry Fayol
Option C:	Du Pont & Remington Rand
Option D:	Thomson Alwa
15.	Which of the following is not a criterion of an Economic Appraisal?
Option A:	Avg. Rate of Return
Option B:	Pay-back Period
Option C:	Net Economic Value
Option D:	Net Present Value
16.	OSHA stands for
Option A:	Organization of Safety & Health Administration
Option B:	Occupational Safety & Harbor Administration
Option C:	Ocean Sea & Harbor Administration
Option D:	Occupational safety & Health Administration
17.	If a is the optimistic time, b is the pessimistic time and m is most likely time of an activity, the expected time of the activity, is
Option A:	a + 4m + b) / 6
Option B:	(a + 2m + b) /6
Option C:	(a + m + b) / 6
Option D:	(a + 5m + b) / 6
18.	What is the full form of SQC?
Option A:	Site Quality Control
Option B:	Statistical Quality Control
Option C:	Substandard Quality Control
Option D:	Substantial Quality Control
19.	What is ISO14000?
Option A:	Series of Environmental Management Standards
Option B:	Series of Ecological Standards
Option C:	Series of Mechanical Management Standards
Option D:	Series of Electrical Management Standards
20.	Sampling is the process of determining the quality of a
Option A:	small part from a large group
Option B:	small group from a small part
Option C:	small group at random
Option D:	large group from a small part

Q2	**20 Marks**

A	**Solve any Two Questions out of Three** **2 X 5 = 10 marks**
i.	**What are the functions of Material management?**
ii.	**What is resource allocation? What are the different techniques for resource allocation?**
iii.	**What is the role of inspection in quality control? Explain.**
B	**Solve any One Question out of Two** **1 X 10 = 10 marks**
i.	**The details of a construction project are given below.**

ACTIVITY	(1-2)	(2-5)	(5-8)	(1-4)	(4-6)	(6-8)	(1-3)	(3-7)	(7-8)
T_o (wk)	10	6	2	8	5	2	1	7	1
T_m (wk)	12	9	3	10	6	3	2	9	2
T_p (wk)	16	12	5	12	8	4	3	11	3

i) Draw PERT network. Find out critical path and expected project duration.
ii) What is the probability the work can be completed in 24 weeks.
iii) Find out the project duration corresponding to 98% probability.

Z value	-3.0	-2.0	-1.0	0	1	2	3
Probability	0.001	0.023	0.157	0.5	0.841	0.977	0.999

ii. The Following data pertains to a construction project.

Activity	P	Q	R	S	T	U	V	W	X
Preceding Activity	-	P	P	Q	R	-	U	S, T	V, W
Duration in weeks	2	3	4	5	6	7	6	5	4

i) Draw Activity on Activity on Node network Diagram.

ii) Determine the critical path and project duration.

iii) Calculate the values of Total Float, Free Float & Independent Float.

Q3 **20 Marks**

A **Solve any Two Questions out of Three** **2 X 5 = 10 marks**

i. What are the records to be maintained on construction site?

ii. Discuss different phases in life cycle of construction projects.

iii. Define safety. List the common causes of accidents in construction projects and also suggest suitable measures to prevent them.

B **Solve any One Question out of Two** **1 X 10 = 10 marks**

i. The project has following details.

ACTIVITY	(10-20)	(20-30)	(30-50)	(10-40)	(40-50)	(50-60)
Normal time(weeks)	24	56	48	36	48	24
Crash time(weeks)	16	36	28	24	46	24
Normal Cost (crores)	1.8	1.5	1.8	2.4	0.8	2.0
Crash Cost (crores)	2.2	2.2	2.4	3.0	2.0	2.0

Assuming the indirect cost of Rs. 4 lakhs (0.04 crores) per week.

Find the optimum cost and corresponding duration.

ii.

Table shows activities, their durations and labour requirements.

ACTIVITY	(1-2)	(2-3)	(2-4)	(3-5)	(4-6)	(5-7)	(6-7)
Duration in days	2	3	4	2	4	3	6
Crew size	4	3	3	5	3	4	3

i)Prepare resource histogram for early start and late start schedules.
ii) Which one would you prefer? Why?

University of Mumbai

Examination 2021 under cluster __ (Lead College: _____)

Examinations Commencing from 1 June 2021

Program: _____

Curriculum Scheme: Rev - 2012

Examination: BE Semester VIII

Course Code: CEC-803 and Course Name: Construction Management

Time: 2 hour Max. Marks: 80

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R12_CIVIL_VIII_CEC803_QP2

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The entire process of a project may be considered to be made up on number of sub process placed in different stage called the
Option A:	Technical key resources
Option B:	Work key structure
Option C:	Work Breakdown Structure (WBS).
Option D:	Organization Breakdown Structure (OBS).
2.	Which is not the Principles of Mr. Henri Fayol
Option A:	Authority
Option B:	Unity of Command
Option C:	Unity of Direction
Option D:	Share Multipliers
3.	_____is known as funder of scientific management.
Option A:	Ethan Hunt
Option B:	Slander Stonel
Option C:	Frederick Taylor
Option D:	Jack Rany
4.	Construction site layout typically represents _____
Option A:	Construction site plan
Option B:	Key plan of building
Option C:	Architecture Plan
Option D:	Footing Layout
5.	Which of these factor does not affect Construction site layout?
Option A:	Nature of Project
Option B:	Method of Construction
Option C:	Lead time of Resource
Option D:	Medical Facilities
6.	Which is the feasibility studies required for Mega Project as per Central Government of Indian?
Option A:	Building Sale feasibility studies

Option B:	Water Utility feasibility studies
Option C:	Environmental feasibility studies
Option D:	Project Owner feasibility studies
7.	Activity on node diagram does not have _____
Option A:	Dummy Activity
Option B:	Node
Option C:	Arrow
Option D:	Floats
8.	_____is Known as Total Float
Option A:	Latest Finish Time of activity +Earliest Finish Time of Activity
Option B:	Earliest Finish Time of activity + Latest Finish Time of Activity
Option C:	Earliest Start Time of activity – Latest Start Time of Activity
Option D:	Latest Start Time of activity –Earliest Start Time of Activity
9.	For Researched Project _____Method is Mostly used
Option A:	C.P.M.
Option B:	E.O.Q.
Option C:	W.B.S.
Option D:	P.E.R.T.
10.	_____path had Maximum Duration of Project
Option A:	Forward Pass Equity
Option B:	Reversed Pass Equity
Option C:	Critical
Option D:	Sub Critical
11.	Cost Slope is ration of differences between _____&_____
Option A:	Normal Cost, Normal Duration
Option B:	Crash Cost, Crash Duration
Option C:	Crash-Normal (Cost), Normal-Crash (Duration)
Option D:	Plane Duration, Plane Duration
12.	_____Martial of Construction Projects Comes in "C"- Types of A-B-C Analysis
Option A:	Cement
Option B:	Sand
Option C:	Bricks
Option D:	Nails for formwork
13.	_____Stock is kept in excess beyond the required stock to counter Emergencies
Option A:	Emergencies Stock
Option B:	Surplus Stock
Option C:	Buffer Stock
Option D:	Piping Stock
14.	Human Resource Management involves _____Tasked.
Option A:	Manpower planning, recruitment, Selection training & Performance evaluation of

	worker
Option B:	Manpower planning, recruitment, Selection training & Skill Set Non evaluation of worker
Option C:	Equipment's planning, Purchas, & Skill Set Non evaluation of worker
Option D:	Equipment's planning, Purchas, & Skill Set evaluation of worker
15.	O.S.H.A. is _____
Option A:	Operators Safety and Health Administration
Option B:	Operators Safety and Health Audit
Option C:	Occupational Safety and Health Audit
Option D:	Occupational Safety and Health Administration
16.	Which Acts Talks about damages to paid to labour due to accidents
Option A:	Workmen's compensation act
Option B:	Buildings Bye Laws
Option C:	Factories act
Option D:	Minimum wages act
17.	When Forward pass and Reverse pass in the Network is same than that path is _____
Option A:	Dummy Path
Option B:	PERT Path
Option C:	Normal Path
Option D:	Critical Path
18.	_____ indicates requirement of Labours for Whole life of Project.
Option A:	Histograms
Option B:	Life Cycle of Graph
Option C:	Reviser Graph
Option D:	History Graph
19.	On each _____no's of Labours on Construction site minimum one set of Fist aid Box is necessary as per Factories Act.
Option A:	75
Option B:	250
Option C:	300
Option D:	150
20.	Site order book is used for recording_____
Option A:	Instructions by the executive engineers
Option B:	Construction measurements
Option C:	Issue of store equipment
Option D:	Names of the casual labour

Q2	**(20 Marks)**
A	**Solve any Two** **5 marks each**
i.	Write short note on: a. EOQ

<table>
<tr><td></td><td>b. Job Layout
c. Time overrun and cost overrun</td></tr>
<tr><td>ii.</td><td>What do you understand by injury severity rate, injury frequency rate and injury index?</td></tr>
<tr><td>iii.</td><td>Explain WBS with suitable example.</td></tr>
<tr><td>B</td><td>Solve any One 10 marks each</td></tr>
<tr><td>i.</td><td>Following table shows the activities, their interdependence and the durations
a. Work out all activity times and floats
b. Identify the critical path and the project duration
<table>
<tr><th>Activity</th><th>Immediate predecessor</th><th>Normal Duration (days)</th></tr>
<tr><td>P</td><td>-</td><td>5</td></tr>
<tr><td>Q</td><td>P</td><td>7</td></tr>
<tr><td>R</td><td>P</td><td>6</td></tr>
<tr><td>S</td><td>Q</td><td>2</td></tr>
<tr><td>T</td><td>Q</td><td>5</td></tr>
<tr><td>U</td><td>R</td><td>6</td></tr>
<tr><td>V</td><td>S,T</td><td>5</td></tr>
<tr><td>W</td><td>U</td><td>4</td></tr>
<tr><td>X</td><td>V,W</td><td>7</td></tr>
</table></td></tr>
<tr><td>ii.</td><td>Write a detailed Note on different feasibility Study on Construction Project.</td></tr>
</table>

<table>
<tr><td>Q3</td><td>(20 Marks)</td></tr>
<tr><td>A</td><td>Solve any Two 5 marks each</td></tr>
<tr><td>i.</td><td>Write short note on:
a. A-B-C analysis
b. Bar chart and its limitations
c. Updating of project</td></tr>
<tr><td>ii.</td><td>What is difference between resource smoothening and resource leveling</td></tr>
<tr><td>iii.</td><td>Explain the role of various agencies involved in any Construction Project.</td></tr>
<tr><td>B</td><td>Solve any One 10 marks each</td></tr>
<tr><td>i.</td><td>Find the optimum cost and optimum duration for the project. The indirect cost of the project is Rs. 3000/week.
<table>
<tr><th>Activity</th><th>Immediate predecessor</th><th>Normal Duration (weeks)</th><th>Normal Cost (Rs.)</th><th>Crash Duration (weeks)</th><th>Crash Cost (Rs.)</th></tr>
<tr><td>A</td><td>-</td><td>3</td><td>3000</td><td>1</td><td>4500</td></tr>
<tr><td>B</td><td>A</td><td>2</td><td>5000</td><td>1</td><td>8000</td></tr>
<tr><td>C</td><td>B</td><td>4</td><td>2000</td><td>2</td><td>4000</td></tr>
<tr><td>D</td><td>B</td><td>3</td><td>7000</td><td>1</td><td>10000</td></tr>
<tr><td>E</td><td>B</td><td>2</td><td>12500</td><td>2</td><td>12500</td></tr>
<tr><td>F</td><td>C</td><td>3</td><td>10000</td><td>1</td><td>13000</td></tr>
<tr><td>G</td><td>D,E</td><td>5</td><td>6500</td><td>3</td><td>9000</td></tr>
<tr><td>H</td><td>F</td><td>4</td><td>4300</td><td>2</td><td>8000</td></tr>
</table></td></tr>
<tr><td>ii.</td><td>What do you understand by a quality control?, Prepared a quality control check list for R.C.C. Frame Structures, Identify varies activity involved and assumed all the necessary data required.</td></tr>
</table>

University of Mumbai

Examination 2021 under cluster __ (Lead College: _____)

Examinations Commencing from 1 June 2021

Program: Civil Engineering

Curriculum Scheme: Rev -2012

Examination: BE Semester VIII

Course Code: CE-E804 and Course Name: Advanced Repairs & Rehabilitation of Structures

Time: 2 hour Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	The process by which buildings are made more resistant to earthquake is the
Option A:	Retrofitting
Option B:	Adding partition walls
Option C:	Soundproof
Option D:	Centrally Heating
2.	Which of following reasons causes decrease in strength of structures
Option A:	Class of structure
Option B:	Jacketing of columns
Option C:	Aging of structures
Option D:	Painting of structures
3.	To repair hairline structural cracks in high strength concrete beam, which type of injection grout you will prefer
Option A:	Low viscosity and high compressive strength
Option B:	Having high price
Option C:	High viscosity and low compressive strength
Option D:	Any grout material
4.	Choose correct pair of the essential elements for corrosion process
Option A:	Carbon dioxide and chlorine
Option B:	Nitrogen and hydrogen
Option C:	Carbon dioxide and helium
Option D:	Moisture and oxygen
5.	In order to secure superstructure from an earthquake this of following methods is recommended.
Option A:	Reinforcement addition
Option B:	Base Isolation
Option C:	Energy Dissipation
Option D:	Removing shear wall
6.	What are performance requirements for repair material for near surface material for spalling of concrete cover.
Option A:	High thermal resistance

Option B:	High shear bond with substrate
Option C:	Good looks
Option D:	Low impact resistance
7.	Choose the correct statement about electrochemical chloride extraction
Option A:	It is a destructive method
Option B:	It can increase the pH of thin layer of concrete surrounding the reinforcement.
Option C:	It is expensive hence rarely used
Option D:	It is used to extract chloride from the water surrounding steel.
8.	In which method of jacketing , the max increase in mass of element takes place.
Option A:	Steel jacketing
Option B:	Concrete jacketing
Option C:	FRP jacketing
Option D:	Steel and FRP combined
9.	Choose the correct statement from following
Option A:	Premature plate end debonding can cause failure of elemnets.
Option B:	FRP jacketing increase mass of the structural element to large extent.
Option C:	Strength of structural elements remains same for entire life.
Option D:	Masonry structures do not suffer any damage during severe earthquake
10.	The most important criteria for heritage structures restoration is
Option A:	It must be economical
Option B:	Increasing life span of heritage structures
Option C:	Making structure more beautiful than present state
Option D:	Maintaining and stabilizing the existing form and integrity of a historical structure so as to protect its heritage value.
11.	Choose the correct statement about FRP materials
Option A:	Mechanical properties of fiber-reinforced composites depend on Fiber length, orientation, and volume fraction
Option B:	Mechanical properties of fiber-reinforced composites are independent of Properties of constituents
Option C:	Mechanical properties of fiber-reinforced composites are independent of interface strength
Option D:	Mechanical properties of fiber-reinforced composites depend on matrix only.
12.	Choose correct statement about carbon fibre reinforced polymer and glass fibre reinforced polymer
Option A:	Tensile strength of GFRP is in the range of 100-150 MPa
Option B:	Glass fibre have maximum tensile strength among the two.
Option C:	Tensile strength of CFRP is in the range of 250-415 MPa
Option D:	Carbon fibre have good rigidity and excellent strength
13.	Choose the correct statement about restoration of heritage structures
Option A:	One major problem incurred along heritage buildings is biological vegetation growth
Option B:	Roof leakages of occurring in a heritage building can be prevented by replacement of damaged clay roof tile by asbestos sheet roof.

Option C:	Renovation work on a historic timber structure where , timber bracings were exposed to marine borers and were rotten can be replaced by steel bracings.
Option D:	As the restoration of heritage structures is very costly, it is better to demolish the structure and construct a new one.
14.	Which of following testing equipment is used in used for inspection of structures during major inspection
Option A:	Rain gauges
Option B:	Measuring jar
Option C:	Test tubes
Option D:	Strain gauges
15.	To know the quality of concrete which of following NDT testing methods is used
Option A:	Charpy impact test
Option B:	Compression strength
Option C:	Ultrasonic pulse velocity test
Option D:	Split tensile strength of concrete
16.	Choose the correct statement from following
Option A:	Repair of Fire damaged structures involves repair of damaged concrete , concrete cover and application fireproof paint
Option B:	Maintainace of tunnels involves enlarging its section
Option C:	Underwater maintainace involves structures damaged due to rain
Option D:	Masonry repair is costly and generally avoided
17.	Choose the correct statement from following
Option A:	Special maintenance is under extraordinary condition and requires sanction and performed to rectify heavy damage.
Option B:	Remedial maintenance is the service maintenance attended to the structure periodically.
Option C:	Special maintenance is the service maintenance attended to the structure periodically.
Option D:	The maintenance work done after the defects occurred in the structure is called Routine maintenance
18.	Choose the technique you will prefer to avoid sulphate attack
Option A:	Use of expensive cement
Option B:	Providing high water cement ratio
Option C:	Use of cement with low C_3A content
Option D:	Use of coloured concrete
19.	The techniques used in Global Retrofitting are i) Adding shear wall ii) Jacketing of beams, columns, beam- column joints, iii) Strengthening individual footings iv) base isolation
Option A:	Only i) and ii) are correct
Option B:	Only i) and iii) are correct

Option C:	All are correct
Option D:	Only iii) and iv) are correct
20.	Which of following is used to increase strength of columns.
Option A:	Scaffoldings
Option B:	Concrete Jacketing
Option C:	Shoring
Option D:	Painting

Subjective/Descriptive questions

Q2 (20 Marks Each)	Solve any Four out of Six 5 marks each
A	Explain any five a reason for which strengthening of structure is required.
B	Explain with neat sketch plate bonding technique.
C	What are the important issues while repairing tunnels.
D	Write a short note on FRP strengthening of columns.
E	Explain the Base isolation technique.
F	Explain the importance of post repair maintenance of structures.

Q3 (20 Marks Each)	Solve any Four out of Six 5 marks each
A	Explain the external post tensioning technique.
B	Explain the challenges in underwater repairs.
C	Explain different types of FRP used for strengthening of RCC structures.
D	Explain the restoration of heritage structure with an example.
E	How the masonry structure are constructed to minimize damage during an earthquake.
F	A RCC structure has suffered severe damage during earthquake. Design the strengthening strategy.

University of Mumbai

Examinations Commencing from 1 June 2021

Program: **Civil Engineering**

Curriculum Scheme: **Rev - 2016**

Examination: **BE** Semester: **VIII**

Course Code: **CE-DLO8032** and Course Name: **Industrial Waste Treatment**

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Stream standard method of classification for Fresh water is
Option A:	Class AA, Class A, Class B, Class C, Class D
Option B:	Class SA, Class SB, Class SC, Class SD
Option C:	Class GA, Class GB, Class GC, Class GD
Option D:	Class A, C Class B, Class C, Class D
2.	A novel approach to waste disposal for organic decomposable type of waste is to increase the amount of oxygen in the receiving streams by artificial method is called
Option A:	Stream Classification
Option B:	Stream Aeration
Option C:	Stream Augmentation
Option D:	Stream Sanitation
3.	Good housekeeping of any industry does not support
Option A:	Eliminates accidents and fire hazard
Option B:	Provides water and food supply
Option C:	Maintains safe, healthy work conditions
Option D:	Improves productivity and control
4.	During which of the following conditions, the deoxygenation is equal to reoxygenation?
Option A:	Stream exposed to atmosphere
Option B:	Increased volume
Option C:	Greener vegetation
Option D:	High temperature
5.	On which of the following does the self-purification process does not depend?
Option A:	Volume
Option B:	Flow rate
Option C:	Temperature
Option D:	Aquatic Species
6.	Various actions involved in self-purification process are
Option A:	Dilution, Current, Temperature, Sunlight Etc.
Option B:	BOD, COD, Total solids, Dispersion Etc
Option C:	Floatation, Filtration, Disinfection, Coagulation Etc
Option D:	Settling, flocculation, dispersion, agitation Etc

7.	In industries, the most polluted source of wastewater is from ----------
Option A:	Process
Option B:	Utility
Option C:	Toilets
Option D:	Kitchen
8.	Effluent standards are
Option A:	Upper limit which should be exceeded
Option B:	Lower limit which should be exceeded
Option C:	Upper limit which should not be exceeded
Option D:	Always the lowest limit
9.	Use of treated industrial wastewater for irrigation is example of -----
Option A:	Reduction at source
Option B:	Recycling
Option C:	Recovery
Option D:	Reuse
10.	Treatability study is to know …..
Option A:	How waste water is removed from streams
Option B:	How the waste water should be treated
Option C:	How the turbidity of waste water is removed
Option D:	How the odour of waste water is removed
11.	--- is popular method of removal of heavy metal
Option A:	Chemical reduction
Option B:	Coagulation
Option C:	Alkaline chlorination
Option D:	Chemical precipitation
12.	Proportioning is type of ---------
Option A:	Chemical treatment
Option B:	Tertiary treatment
Option C:	Unit process
Option D:	Unit operation
13.	----is the most difficult to treat in the stream of wastewater from Pulp & Paper industry
Option A:	Yellow Liquor
Option B:	Brown Liquor
Option C:	Red Liquor
Option D:	Black liquor
14.	Spent wash is incinerated for recovery of
Option A:	Potassium
Option B:	Nitrogen
Option C:	Phosphorous
Option D:	Carbon

15.	Wet Blue is the term used for under process product from ……. industry
Option A:	Textile
Option B:	Paper and pulp
Option C:	Electroplating
Option D:	Tannery
16.	Common Effluent Treatment Plant is used to treat
Option A:	Industrial Waste Water
Option B:	Domestic Waste Water
Option C:	Agriculture Waste
Option D:	Storm water
17.	Environment Impact Assessment (EIA) is done
Option A:	Before the project
Option B:	After the project
Option C:	During the project
Option D:	Any time in life cycle of project
18.	Bio-chemical oxygen demand (BOD) for the first stage is generally not referred to
Option A:	Initial demand
Option B:	First stage demand
Option C:	Carbonaceous demand
Option D:	Nitrogenous demand
19.	Environmental Impact Assessment (EIA) is mandatory under which one of the following Indian legislations:
Option A:	Environment (Protection) Act
Option B:	Wildlife Protection Act
Option C:	Air (Prevention and Control of Pollution) Act
Option D:	Indian Forest Act
20.	Large laws came into existence as the problems began arising e.g. Handling & Management Of Hazardous Waste Rules 1989, a gazette notification was issued by the Ministry of Environment on march 13th 1992 & later amended on April 22nd 1993 introducing ‘Environmental Audit’ in India to
Option A:	Minimize generation of wastes & pollution.
Option B:	Treatment of solid waste
Option C:	Treatment of industrial waste and its various pollutants
Option D:	Minimize the use of resource

Q2 **(20 Marks Each)**	**Option A and B are compulsory**
A	**Solve any Two** **5 marks each**
i.	Write Streeters Phelps equation and explain its significance, parameters and application.
ii.	Differentiate between aerobic treatment and anaerobic treatment.
iii.	Explain removal of heavy metals from electroplating waste.
B	**Solve any One** **10 marks each**
i.	Explain the effluent treatment plant required for treating waste from sugar industry. List the byproducts obtained from manufacturing process of sugar.
ii.	Describe the need for common effluent treatment plant and list the treatments unit that may be required for treating the combined waste. .

Q3 **(20 Marks Each)**	**Option A and B are compulsory**
A	**Solve any Two** **5 marks each**
i.	Write effect of disposal of industrial waste water on natural water bodies
ii.	What is population equivalence and explain its impact on waste water treatment
iii.	Discuss characteristics of dairy waste and type of treatment suggested.
B	**Solve any One** **10 marks each**
i.	Explain the steps in EIA and Environment Audit. How these differ from each other.
ii.	Explain in detail methods of neutralization.

University of Mumbai
Examination June 2021
Examinations Commencing from 1st June 2021

Program: **IT01028**

Curriculum Scheme: Rev2016

Examination: BE Semester VIII

Course Code: 52965 and Course Name: Environmental Management

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which of the following salts is the main cause of permanent hardness of water?
Option A:	Magnesium sulphate
Option B:	Magnesium bicarbonate
Option C:	Magnesium carbonate
Option D:	Potassium sulphate
2.	Which of the following is incorrect, if we only achieve two out of three pillars of Sustainable Development?
Option A:	Social + Economic Sustainability = Equitable
Option B:	Social + Environmental Sustainability = Bearable
Option C:	Economic + Environmental Sustainability = Viable
Option D:	Political + Environmental Sustainability = Bearable
3.	In a food chain animals constitute the:
Option A:	First trophic level
Option B:	Second trophic level
Option C:	Intermediate trophic level
Option D:	Ultimate trophic level
4.	What are the Primary Goals of Sustainability? i. The end of poverty and hunger ii. Better standards of education and healthcare - particularly as it pertains to water quality and better sanitation iii. To bring about a gradual and sometimes catastrophic transformation of the environment iv. Sustainable economic growth while promoting jobs and stronger economies
Option A:	i,ii,iv
Option B:	i,ii,iii
Option C:	i,iii,iv
Option D:	ii,iii,iv
5.	How many percentage of fissionable U-235 occurring in uranium?
Option A:	0.20%
Option B:	0.70%
Option C:	1.00%

Option D:	1.50%
6.	Which of the following is NOT a problem caused by deforestation?
Option A:	Loss of biodiversity
Option B:	Hurting the economy
Option C:	The harming of many indigenous peoples
Option D:	Creating political and social issues
7.	Biodiversity is important for a variety of reasons i. promotes healthier, maintained ecosystems that provide services to us ii. genetic variety of crops, livestock, and marine organisms iii. There are too many animal species on the world iv. ensures that humans are provided with a healthy, nutrient rich diet
Option A:	i,ii,iv
Option B:	i,ii,iii
Option C:	i,iii,iv
Option D:	ii,iii,iv
8.	The reason of Arc blast is
Option A:	Poor contact within electrical wire splices
Option B:	Radio frequency emissions from high-power transmitters
Option C:	Discharge of high electrical current through open air
Option D:	Failure to lock-out and tag-out electrical breakers
9.	Match the following: Earth Spheres Characteristics a. Hydrosphere 1. It lies above 50 km which coincides with the thermosphere b. Lithosphere 2. Earth's crust and a lower portion of the mantle c. Biosphere 3. Earth's water which exists in both fresh and saline form d. Ionosphere 4. Zone incorporating elements of the hydrosphere, lithosphere and atmosphere
Option A:	a= 1 b=2 c=3 d=4
Option B:	a= 4 b=23 c=2 d=1
Option C:	a= 3 b=2 c=4 d=1
Option D:	a= 1 b=4 c=2 d=3
10.	Plant species with a wide range of genetic distribution evolve into a local population known as
Option A:	Ecotype
Option B:	population
Option C:	Ecosystem
Option D:	Biome
11.	Name the group of species which exploit the abiotic and biotic resources in a similar way?

Option A:	Guild
Option B:	Ecads
Option C:	Biomes
Option D:	Community
12.	The Montreal Protocol, finalized in 1987, is a global agreement to protect
Option A:	Hydrosphere
Option B:	Ionosphere
Option C:	Biosphere
Option D:	Stratospheric ozone layer
13.	Lichens are good bioindicators for
Option A:	Environmental radiation
Option B:	Soil pollution
Option C:	Water and air pollution
Option D:	Evolution
14.	Opportunities for social innovation are greatest when
Option A:	CSR is aligned with a firm's core skills and capabilities.
Option B:	CSR spending of a firm is larger than that of its competitors.
Option C:	CSR is pursued by a firm to improve its reputation.
Option D:	CSR is pursued by a firm to enhance human capital.
15.	Environment Impact assessment(EIA) is done
Option A:	Before the project
Option B:	After the project
Option C:	During the project
Option D:	Any time in life cycle of project
16.	Match the following: Column "A" Column "B" (i) Montreal Protocol (a) 1974 (ii) Air (Prevention and Control of Pollution) Act (b) 1986 (iii) The Environment Protection Act (c)1987 (iv)The Water (Prevention and Control of Pollution) Act (d) 1981
Option A:	i-a, ii-d, iii-b, iv-c
Option B:	i-c, ii-b, iii-d, iv-a
Option C:	i-c, ii-d, iii-b, iv-a
Option D:	i-c, ii-d, iii-a iv-b
17.	What are the implementation structures of Biodiversity Act - 2002
Option A:	A two tiered structure has been established under the Act at the national and state levels.
Option B:	A three tiered structure has been established under the Act at the national, state and local levels.
Option C:	A four tiered structure has been established under the Act at the national, state, district and local levels.
Option D:	Not structured
18.	Which document provides guidance on auditing management systems?
Option A:	ISO 9000

Option B:	ISO 9001
Option C:	ISO 9002
Option D:	ISO 19011
19.	Within ISO 14001, what do “can” refer to?
Option A:	A requirement
Option B:	A recommendation
Option C:	A permission
Option D:	A possibility or a capability
20.	Which is the most recent pronouncement of the government’s commitment to improving environmental conditions?
Option A:	National Environmental Policy
Option B:	National Water Policy
Option C:	Environment Act
Option D:	Air Policy

Q2 **(20 Marks)**	
A	**Solve any Two** **5 marks each**
i.	What is meant by disaster? Differentiate between Industrial disaster and Manmade disaster.
ii.	Explain food chain with respect to four major parts. Give examples of food chain
iii.	What are the stages of the EMS lifecycle process?
B	**Solve any One** **10 marks each**
i.	Discuss the consequences of deteriorating air quality on humans, plants and animals.
ii.	What all are components of environment? Define each component.

Q3 **(20 Marks)**	
A	**Solve any Two** **5 marks each**
i.	Explain Global warming. How does it take place?
ii.	Explain in detail what is Environmental Quality Management?
iii.	Give a brief account of Air (P&CP Act).
B	**Solve any One** **10 marks each**
i.	What is meant by habitat? What are its types? Elaborate on them.
ii.	Classify Ecosystems and explain them in detail.

University of Mumbai
Examination June 2021
Examinations Commencing from 1st June 2021
Program: **Mechanical Engineering**
Curriculum Scheme: Rev 2016
Examination: BE Semester VIII
Course Code: ILO 8021 and Course Name: Project Management
Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Projects are unique and temporary, while operations are
Option A:	Specific And Targeted
Option B:	Ongoing and Permanent with a Repetitive Output
Option C:	Unique And Permanent With Non-Repetitive Outputs
Option D:	Ongoing And Temporary
2	**From a practical perspective, what is the most important element of a good project communication management approach?**
Option A:	Setup a regular and frequent method for communicating with team members and stakeholders and then follow it.
Option B:	Conduct one-on-one meetings (face-to-face or virtual) with project team members every week.
Option C:	Ensure all project communication between team members and stakeholders goes through the Project Leader so that there is no opportunity for misunderstanding.
Option D:	Telephonic conversation, and Emails
3.	The lowest element in the hierarchical breakdown of the WBS is
Option A:	Work package
Option B:	Responsibility matrix
Option C:	Bottoms up budget
Option D:	Deliverable
4.	Use of PMIS is comparatively less in this process group of project management
Option A:	Initiating
Option B:	Executing
Option C:	Monitoring and Controlling
Option D:	Planning
5.	Which of the following represents the estimated value of the work actually accomplished?
Option A:	Earned value (EV)
Option B:	Planned value (PV)
Option C:	Actual cost (AC
Option D:	Cost variance (CV)
6.	_____ is the discounting rate, which delivers a Net Present Value equal to zero
Option A:	ARR

Option B:	IRR
Option C:	NPV
Option D:	Profitability Index
7.	Project is stopped due to either its successful or unsuccessful conclusion. Auditing, team on new assignment, assets transferred as per policy is known as :
Option A:	Extinction
Option B:	Addition
Option C:	Integration
Option D:	Starvation
8.	The process of partnering is an attempt to mitigate he risk associated with
Option A:	Networking
Option B:	Uncertainty
Option C:	Risks
Option D:	Subcontracting
9	Project Risk = _----------* Consequences of Event. None of the above
Option A:	Loss
Option B:	Outcomes of Event
Option C:	Probability of Event
Option D:	Profit
10.	What is the correct sequence of stages in group development
Option A:	Forming, Norming, Performing, Storming, Adjourning
Option B:	Forming, Norming, Storming, Performing , Adjourning
Option C:	Forming, Storming, Norming, Performing , Adjourning
Option D:	Forming, Performing, Norming, Storming , Adjourning
11.	An activity has an optimistic time 11 days, a most likely time of 15 days, and a pessimistic time of 23 days. What is its variance?
Option A:	15.6
Option B:	16.33
Option C:	4
Option D:	2
12.	What are the determinants of project success as per Iron Triangle?
Option A:	Resources, Cost, Performance
Option B:	Knowledge, Time, Resources
Option C:	Cost, Skills, Performance
Option D:	Cost, Performance, Time
13	What is the correct sequence for the following processes of Project Risk Management: 1. Plan Risk Management; 2. Perform Qualitative Risk Analysis; 3. Identify Risks; 4. Perform Quantitative Risk Analysis; 5. Plan Risk Responses;

	6. Control Risks
Option A:	1-2-3-4-5-6
Option B:	1-3-2-4-5-6
Option C:	1-3-4-2-5-6
Option D:	3-1-2-4-5-6
14.	Arrange the following elements of the Project Cycle in the right order: A- Project Appraisal B- Feasibility Analysis C- Negotiation D- Project Selection
Option A:	A-B-C-D
Option B:	B-A-C-D
Option C:	B-A-D-C
Option D:	B-C-A-D
15.	An activity takes 4 days to complete at a normal cost of Rs.500. If it is possible to complete the activity in 2 days with an additional cost of Rs.700, what is the incremental cost of activity.
Option A:	100
Option B:	125
Option C:	1000
Option D:	250
16.	In PERT/CPM, slack time is :
Option A:	Is the amount of time a task may be delayed without changing the overall project completion time
Option B:	Is the latest time an activity can be started without delaying the entire project
Option C:	Is a task or subproject that must be completed
Option D:	Marks the start or completion of a task
17.	The review of the successes and the mistakes is normally held during _____ phase.
Option A:	Initiation
Option B:	Planning
Option C:	Execution
Option D:	Closure
18.	Cost performance index value is less than 1 indicates :
Option A:	Cost under run
Option B:	Cost overrun
Option C:	Cost average
Option D:	Cost Variance
19.	Why does scope creep cause a delay on a project?
Option A:	The project resources are doing the scope creep work and not the originally planned work, causing the originally planned tasks to be delayed.
Option B:	Project work is postponed until the magnitude of scope creep is defined.
Option C:	Scope creep causes task estimates to increase.
Option D:	Scope creep causes cost estimates to increase.

20.	Goldratt's critical chain method is based on
Option A:	Theory of constraints
Option B:	Critical path method
Option C:	Supply of raw material in time
Option D:	Use of concurrent engineering principle

Q.2	**Solve any Four out of Six . 5 Marks Each**
A	What are the knowledge areas and process groups in Project Management as per PMI?
B	Explain various project selection models.
C	What is Goldratt's critical chain method?
D	Determine the net present value for a project that costs Rs. 2,40,000/- would yield after tax cash flows as follows. Assume cost of capital is 10% Year | CASH Flow in Rs. 1 | 25,000 2 | 75,000 3 | 80,000 4 | 100,000 Comment on feasibility of project based on NPV
E	Explain importance of ethics in projects.
F	What are the different ways of closing the project?
Q.3	**Solve any Two Questions out of Three 10 Marks Each**
A	a. A consulting project has an actual cost of Rs. 45000, Scheduled cost Rs. 35000, and value of completed work is Rs. 40000. Find the Schedule and Cost Variance. Also find SPI and CPI. b. What is a contract? Explain different types of contracts.
B	R & D project has a list of tasks to be performed whose time estimates are given in the as follows. **Table-1-Time Estimation for R &D Project**

Activity *i* *j*	Activity Time	to	t_m	t_p
1-2	A	4	6	8
1-3	B	2	3	10
1-4	C	6	8	16
2-4	D	1	2	3
3-4	E	6	7	8
3-5	F	6	7	14
4-6	G	3	5	7
4-7	H	4	11	12
5-7	I	2	4	6
6-7	J	2	9	10

	a. Draw the project network. b. Find the critical path. c. Find the probability that the project is completed in 19 days. If the probability is less than 20%, find the probability of completing it in 24 days.
C	Write short notes on. a. Work Breakdown Structure b. Project Procurement Management,
