

KATHMANDU UNIVERSITY
End Semester Examination
January/February 2024

Marks Scored:

Level : B.E.
Year : II

01 FEB 2024

Course : CEEG 201
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date :

SECTION "A"

[20Q. × 0.5 = 10 marks]

Choose and encircle the most appropriate option from each set of choices.

- The unit of measurement of flooring works is:
a. Cubic meter b. Square meter c. Running meter d. Point
- What is the reasonable percentage for contractor's profit and overhead expenses in rate analysis?
a. 15% b. 20% c. 10% d. 25%
- The type of support in which the reaction occurs only in the direction normal to support is:
a. Fixed b. Hinged c. Pinned d. Roller
- Which of the following statement is **TRUE**?
a. Rate of change of shear force is equal to the bending moment.
b. Rate of change of bending moment is equal to the loading.
c. Rate of change of bending moment is equal to the shear force.
d. Rate of change of shear force is equal to the length of beam.
- The degree of indeterminacy for truss with 21 members, 3 unknown reactions and 10 no. of joints is:
a. 5 b. 4 c. 3 d. 2
- Which of the following equipment falls under earth moving equipment?
a. Hoists b. Compactors c. Roller d. Scraper
- In which type of contract two separate functions of design and construction is carried out by single participant?
a. Lump-sum b. Design Build c. Unit Price d. Negotiated
- For the project task with duration of 5 months and early start time of 2 months, the early finish time is:
a. 3 months b. 7 months c. 10 months d. 2.5 months
- The portion of the precipitation that reaches the stream channel is called as:
a. Runoff b. Infiltration c. Interception d. Transpiration
- The inconsistency of rainfall data is checked with the help of:
a. Mass curve b. Hyetograph c. Double mass curve d. ϕ -index
- Horton's infiltration equation is represented as:
a. $f_p = f_c + (f_0 + f_c)e^{-K_h t}$
c. $f_p = f_c + (f_c - f_0)e^{-K_h t}$
b. $f_p = f_0 + (f_0 - f_c)e^{-K_h t}$
d. $f_p = f_c + (f_0 - f_c)e^{-K_h t}$

12. For shallow streams, which of the following relation is correct regarding the measurement of flow velocity?
 a. $\bar{v} = v_{0.2}$ b. $\bar{v} = v_{0.4}$ c. $\bar{v} = v_{0.6}$ d. $\bar{v} = v_{0.8}$
13. Which of the following statement is **TRUE** regarding dam?
 a. Arch dam resist all the external forces through its self-weight.
 b. Gravity dam can be constructed on weak rock foundation.
 c. The external forces are mainly resisted by shear strength of soil in earthen dam.
 d. Buttress dam resist all the external forces acting upon it only through the support provided by buttresses.
14. Which of the following is **NOT** a river training structure?
 a. Settling basin b. Spurs c. Levees d. Guide banks
15. For a bituminous pavement, the slope of camber as per NRS 2070 is:
 a. 1.5% b. 2.0% c. 2.5% d. 4%
16. For finding stopping distance of a vehicle, the height of line of sight of driver and height of line of obstacle on road are respectively taken as:
 a. 1.2m & 0.1m b. 1.5m & 0.15m c. 1.0m & 0.1m d. 1.2m & 0.15m
17. The suspension cable of suspension bridge is subjected to:
 a. Tension b. Compression c. Shear d. Bending
18. The intermediate supports of a bridge superstructure are known as:
 a. Wing walls b. Abutments c. Piers d. Deck
19. The minimum height of tunnel required for sections other than circular cross-section is:
 a. 2.0m b. 2.1m c. 2.3m d. 2.5m
20. The Q-value is estimated as:
 a. $Q = \frac{RQD}{J_n} + \frac{J_r}{J_a} + \frac{J_w}{SRF}$ b. $Q = \frac{RQD}{J_n} \times \frac{J_r}{J_a} \times \frac{J_w}{SRF}$
 c. $Q = \frac{SRF}{J_n} \times \frac{J_r}{J_a} \times \frac{J_w}{RQD}$ d. $Q = \frac{SRF}{J_n} + \frac{J_r}{J_a} + \frac{J_w}{RQD}$

3. The mass curve of an isolated storm in a 5 km^2 watershed is given below:

Time from start (h)	0	2	4	6	8	10	12	14	16	18
Cumulative rainfall (cm)	0	0.8	2.6	2.8	4.1	7.3	10.8	11.8	12.4	12.6

If the direct runoff produced by the storm is measured at the outlet of the watershed as $3.4 \times 10^5 \text{ m}^3$, estimate the ϕ -index of the storm and duration of rainfall excess. [4+1]

4. Construct a network diagram from the data given below. Also determine the critical path and the duration of the project. [2.5+1.5+1]

Activity	Predecessors	Duration (months)	Activity	Predecessors	Duration (months)
A	-	5	F	B	5
B	-	4	G	C, D	8
C	A	8	H	E, I	22
D	B	8	I	F	2
E	B	8	J	F	12

5. What is contract? Briefly describe various types of contract. [1+3]
6. Why is irrigation necessary? Describe briefly about drip irrigation with its advantages and disadvantages. [1.5+2.5]
7. Explain various stages of engineering survey for highway alignment. [3]
8. Describe various components of bridges with figure. [3]
9. Write short notes on: [4×1.5= 6]
- Gravity Dam
 - Tunnel
 - Streamflow measurement
 - Rate analysis

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SECTION "A"

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Choose and encircle the most appropriate answers from the given choices.

- Barkhusen criteria is ____
 - Negative feedback, $A\beta = 1, \theta = 180^\circ$
 - Positive feedback, $A\beta = 1, \theta = 180^\circ$
 - Negative feedback, $A\beta = 1, \theta = 0$ or multiple of 360°
 - Positive feedback, $A\beta = 1, \theta = 0$ or multiple of 360°
- The open loop voltage gain equals to the ____.
 - Differential voltage gain of Op-amp
 - Gain with negative feedback
 - Gain with positive feedback
 - Infinite
- In RC Phase-shift oscillator ____ RC loops are needed.
 - Two
 - Three
 - Four
 - Five
- The angle of RC phase shift oscillator is calculated as ____.
 - $\varphi = 1/X_C$.
 - $\varphi = \tan^{-1} \frac{X_C}{R}$.
 - $\varphi = \tan^{-1} \frac{1}{R}$.
 - $\varphi = \tan^{-1} \frac{X_L}{R}$
- Which of the following statements about the Wien Bridge Oscillator is correct?
 - The Op-Amp is used in inverting mode.
 - Op-amp circuit is introduced in 180-degree phase shift
 - Feedback network is lead-lag network
 - The amplifier gain condition is $|A| \geq 29$
- A ac circuit contains a capacitor of capacitance $10^{-6}F$, and inductance of $10^{-4}H$. The frequency of electrical oscillations will be ____.
 - $10^5 Hz$
 - $10^2 Hz$
 - $\frac{10^2}{2\pi} Hz$
 - $\frac{10^5}{2\pi} Hz$
- ____ is a fixed frequency oscillator.
 - Crystal oscillator
 - Hartley-oscillator
 - Phase shift oscillator
 - Multivibrator
- In LC oscillator ____ frequencies cannot be generated.
 - very high
 - high
 - very low
 - low

