

KATHMANDU UNIVERSITY
End Semester Examination
February, 2025

Marks Scored:

Level : B.E.
Year : II

Course : CIEG 209
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date

20 FEB 2025

SECTION "A"

[20 Q. × 0.5 = 10 marks]

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

1. The hardness of calcite is
a. 1 b. 3 c. 7 d. 9
2. Which of the following is igneous rock?
a. Gneiss b. Granite c. Sandstone d. Schist
3. Parent rock of Slate is
a. Granite b. Siltstone c. Limestone d. Shale
4. Which is not a type of unconformity
a. Disconformity b. Angular unconformity
c. Non conformity d. Tri conformity
5. The direction of the line generated by the intersection of an inclined plane with a horizontal plane is called
a. Strike b. Direction of dip c. Angle of dip d. Axis
6. Fossils can not be observed in
a. claystone b. Mudstone c. siltstone d. Amphibolite
7. An Anticline fold is
a. A fold formed similar to an arch with the youngest rocks revealed in the center of the fold.
b. A trough-shaped fold with the oldest rocks revealed in the center of the fold.
c. A fold formed similar to an arch with the oldest rocks revealed in the center of the fold.
d. A trough-shaped fold with the youngest rocks revealed in the center of the fold.
8. In a reverse fault, the hanging-wall block has moved _____ relative to the foot wall block.
a. upward b. downward c. sideways d. rotationally
9. Topographic maps do not show:
a. Elevation b. water c. bathymetry d. cities
10. Arun river is the tributary of _____
a. Gandaki b. Koshi c. Karnali d. Mechi

KATHMANDU UNIVERSITY
End Semester Examination
February, 2025

Level : B.E.
Year : II
Time : 2 hrs. 30mins.

20 FEB 2025

Course : CIEG 209
Semester : II
F. M. : 40

SECTION "B"

[5 Q. × 5 = 25 marks]

Attempt *ANY FIVE* questions.

1. Describe physiographic division of Nepal Himalayan. What is its engineering significance?
2. Describe the mechanism of an earthquake. Discuss about the seismicity in Nepal?
3. Describe the physical properties of mineral? Explain engineering significance of rock forming minerals.
4. What is mass movement? Mention the classification of mass movement as per Varne's (1978)?
5. What do you mean by geophysical exploration? Why geophysical exploration is necessary in engineering? Describe the types of geophysical exploration?
6. Describe geological consideration in site investigation of hydropower project?

SECTION "C"

[15 marks]

7. Differentiate between (*ANY TWO*): [2 Q. × 4 = 8 marks]
 - a. Sedimentary rock and Igneous rock
 - b. Primary (P) wave and secondary (S) wave
 - c. Fold and Fault
8. Write Short Notes on (*ANY TWO*): [2Q. × 3.5 = 7 marks]
 - a. Types of plate boundaries
 - b. RMR system
 - c. Effect of volcanic activities

KATHMANDU UNIVERSITY
End Semester Examination

February, 2025
20 FEB 2025

Marks Scored:

Level : B.E.

Year : II

Exam Roll No. :

Time: 30 mins.

Registration No.:

Course : CHEG 212

Semester : II

F. M. : 10

Date :

SECTION "A"

[20 Q. × 0.5 = 10 marks]

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

- If mass, heat, and work are not allowed to cross the boundaries of a system, the system is called
a. Isolated b. Closed c. Open d. Adiabatic
- The speed of an aircraft is given to be 1250 km/h. If the speed of sound at that location is 315 m/s, the Mach number is
a. 0.5 b. 0.85 c. 1.0 d. 1.10
- The specific gravity of a fluid is specified to be 0.82. The specific volume of this fluid is
a. $0.01\text{m}^3/\text{kg}$ b. $0.00122\text{ m}^3/\text{kg}$ c. $0.0082\text{ m}^3/\text{kg}$ d. $82\text{ m}^3/\text{kg}$
- The dynamic viscosity of air at 20°C and 200 kPa is $1.83 \times 10^{-5}\text{ kg/m}\cdot\text{s}$. The kinematic viscosity of air at this state is
a. $0.525 \times 10^{-5}\text{ m}^2/\text{s}$ b. $0.77 \times 10^{-5}\text{ m}^2/\text{s}$
c. $1.47 \times 10^{-5}\text{ m}^2/\text{s}$ d. $1.83 \times 10^{-5}\text{ m}^2/\text{s}$
- The pressure difference between the top and bottom of a water body with a depth of 10 m is (Take the density of water to be 1000 kg/m^3 .)
a. 98,100 kPa b. 98.1 kPa c. 100 kPa d. 10 kPa
- The gage pressure in a pipe is measured by a manometer containing mercury ($\rho = 13,600\text{ kg/m}^3$). The top of the mercury is open to the atmosphere and the atmospheric pressure is 100 kPa. If the mercury column height is 24 cm, the gage pressure in the pipe is
a. 32 kPa b. 24 kPa c. 76 kPa d. 124 kPa
- Consider the vertical rectangular wall of a water tank with a width of 5 m and a height of 8 m. The other side of the wall is open to the atmosphere. The resultant hydrostatic force on this wall is
a. 1570 kN b. 2380 kN c. 2505 kN d. 1410 kN
- A curve that is everywhere tangent to the instantaneous local velocity vector is called a
a. Pathline b. Streamtube c. Streamline d. Streakline
- Water flows in a 5-cm-diameter pipe at a velocity of 0.75 m/s. The mass flow rate of water in the pipe is
a. 88.4 kg/min b. 75 kg/min c. 37.5 kg/min d. 1.47 kg/min

10. A 75-m-high water body that is open to the atmosphere is available. Water is run through a turbine at a rate of 200 L/s at the bottom of the water body. The pressure difference across the turbine is
 a. 736 kPa b. 0.736 kPa c. 1.47 kPa d. 1470 kPa
11. A pump is used to increase the pressure of water from 100 kPa to 900 kPa at a rate of 160 L/min. If the shaft power input to the pump is 3 kW, the efficiency of the pump is
 a. 0.532 b. 0.660 c. 0.711 d. 0.747
12. A water jet strikes a stationary vertical plate vertically at a rate of 18 kg/s with a velocity of 24 m/s. The mass of the plate is 10 kg. Assume the water stream moves in the horizontal direction after the strike. The force needed to prevent the plate from moving vertically is
 a. 192 N b. 240 N c. 334 N d. 432 N
13. There are three additive terms in an equation, and their units are given below. Which one is not a unit of this equation?
 a. J b. W/m c. $\text{kg}\cdot\text{m}^2/\text{s}^2$ d. $\text{Pa}\cdot\text{m}^3$
14. Which similarity condition is related to force-scale equivalence?
 a. Geometric b. Kinematic c. Dynamic d. Kinematic and dynamic
15. The average velocity for fully developed laminar pipe flow is
 a. $V_{\text{max}}/2$ b. $V_{\text{max}}/3$ c. $V_{\text{max}}/4$ d. $2V_{\text{max}}/3$
16. Which one is not correct regarding the boundary layer approximation?
 a. The higher the Reynolds number, the thinner the boundary layer.
 b. The boundary layer approximation may be appropriate for free shear layers.
 c. The boundary layer equations are approximations of the Navier-Stokes equation.
 d. The curve representing boundary layer thickness δ as a function of x is a streamline.
17. For flow along a flat plate with x being the distance from the leading edge, the boundary layer thickness grows like
 a. x b. \sqrt{x} c. x^2 d. $1/x$
18. Air flows at 25°C with a velocity of 3 m/s in a wind tunnel whose test section is 25-cm long. The displacement thickness at the end of the test section is (The kinematic viscosity of air is $1.562 \times 10^{-5} \text{ m}^2/\text{s}$.)
 a. 0.955 mm b. 1.18 mm c. 1.33 mm d. 1.96 mm
19. Piezometer is used to measure _____ pressure.
20. Fluid that does not obey Newton's law of viscosity is called _____.