

KATHMANDU UNIVERSITY
End Semester Examination[C]
May/June, 2019

Marks scored:

Level : B.E. /B.Sc. /B.Tech.

Year : I

Exam Roll No. :

Time: 30 mins.

Course : ENGG 111

Semester : I

F. M. : 20

Registration No.:

Date :

06 JUN 2019

SECTION "A"

[20Q. × 1 = 20 marks]

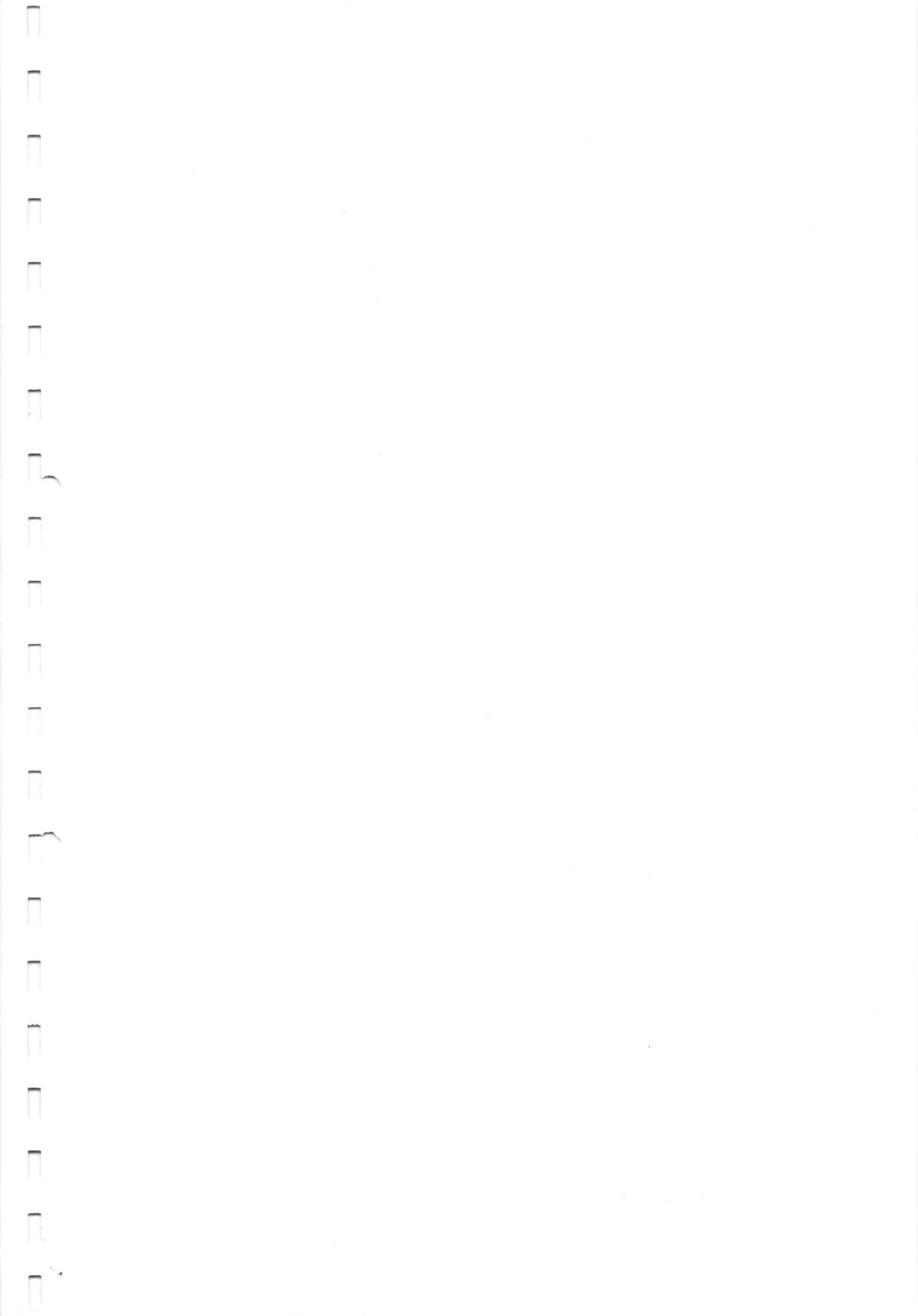
Choose the most appropriate answer and mark [X].

1. The value of the viscosity of an ideal fluid is
 zero unity
 infinity more than that of a real fluid
2. In order to determine the effect of a force, acting on the body, we must know
 magnitude of the force
 line of action of the force
 nature of the force i.e. whether force is push or pull
 all of the above
3. The resultant of two forces each equal to P making an angle β , is given by
 $2P \sin \beta/2$ $2P \cos \beta/2$ $2P \tan \beta/2$ $2P \cot \beta/2$
4. The term 'centroid' is
 the same as center of gravity
 the point of suspension
 the point of application of the resultant of all the forces tending to cause a body to rotate about a certain axis
 none of the above
5. The ratio of shear stress to shear strain is called
 Bulk Modulus Modulus of rigidity
 Modulus of elasticity Proportional Limit
6. Which of the following is incorrect?
 Stress is directly proportional to strain within elastic limit.
 The stress is force per unit area.
 Hooke's law holds good upto the breaking point.
 The ratio of tensile stress and tensile strain is termed as modulus of elasticity.

7. A cycle consisting of one constant pressure, one constant volume and two isentropic processes is known as:
 Carnot Cycle Diesel Cycle Otto Cycle Sterling Cycle
8. Which of the following is correct?
 Gauge pressure = Absolute pressure + Atmospheric pressure
 Atmospheric pressure = Absolute pressure + Gauge pressure
 Absolute pressure = Gauge pressure + Atmospheric pressure
 Absolute pressure = Gauge pressure - Atmospheric pressure
9. The force which do not meet at one point and their lines of action do not lie on the same plane are known as:
 Coplanar concurrent forces Coplanar non-concurrent forces
 Non-coplanar concurrent forces None of these
10. The angle between two forces when the resultant is maximum and minimum respectively are
 180° and 270° 0° and 180° 90° and 180° 90° and 0°
11. Which of the following survey is conducted to delineate and establish boundary of land and properties?
 Topographic Survey Cadastral Survey
 Engineering Survey Geological Survey
12. In a triangular traverse ABCA, if bearing of AB = 30° , bearing of AC = 120° , and AB=AC then $\angle ABC =$
 45° 100° 90° 112°
13. Which of the following RF represents the largest scale of map?
 1:50000 1:20000 1:5000 1:200
14. In Remote Sensing,
 i. The sensors are in direct contact with the objects or events being observed.
 ii. The information needs a physical carrier to travel from the objects/events to the sensors through an intervening medium.
 iii. The electromagnetic radiation is normally used as information carrier.
 iv. A further step of image analysis and interpretation is required in order to extract useful information from the image.
 Choose the appropriate option:
 i and ii are correct i, ii and iii are correct
 ii, iii and iv are correct i, ii, iii and iv are correct

06 JUN 2019

15. The contour line on a topo map
 equal elevation points above the datum plane.
 joins two successive elevation points.
 shows slope distance between two equal elevation points.
 shows Horizontal distance between two successive elevation points.
16. A good brick earth consists of% Silica.
 10-20 20-30 50-60 60-70
17. C_3S in clinker is commonly known as
 Alite Belite Celite Tetra Felite
18. The portion of the building below the ground floor level and above the ground level is known as
 Foundation Sub structure Super structure Plinth
19. Which of the following is not a characteristic of an ideal bridge?
 The line of bridge can have 90° deviation from the line of approach of road.
 Bridge should be in level with the roads to be connected.
 Width of bridge should be adequate enough to incorporate future traffic.
 Bridge should provide adequate water way without unnecessary obstruction of the stream.
20. Steel reinforcement bars in RCC structure is generally provided to
 resist compression force provide ductility to the structure
 resist tension force impart toughness to the structure



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Time : 2 hrs. 30 mins.

Course : ENGG 111
Semester : I
F. M. : 55

SECTION "B"

[33 marks]

Attempt *ALL* the questions. Assume if data is necessary. Use separate answer book for Section "B", Section "C" and Section "D".

1. Illustrate different force system with its characteristics. [2]
2. Two forces F and $2F$ act on a particle. If the first force is increased by 12 kN and second force is doubled, the direction of their resultant remains unchanged. Find the value of F . [3]
3. Two inclined planes have a common vertex and a string passing over a frictionless pulley at the vertex supports two unequal weights W_1 and W_2 . The inclination of the plane carrying the weight W_1 is β_1 to the horizontal and its coefficient of friction is μ_1 and inclination of the plane carrying the weight W_2 is β_2 to the horizontal and its coefficient of friction μ_2 . Find out the expression for the tension T developed in the string assuming that it is same throughout the string. [6]
4. Density is a ratio of mass by volume and is an intensive property whereas mass and volume are extensive properties. Explain why? [3]
5. Is it possible for a heat engine to operate with only one reservoir? Write an explanation supporting your answer. [3]
6. Distinguish between refrigerator and heat pump. [2]
7. Draw and explain PV diagram for a diesel cycle. [3]
8. Derive continuity equation with neat diagram. [3]
9. Can laminar and turbulent flow exist together in a fluid? Explain. [2]
10. Define Viscosity. A pipe 300 m long has a slope 1 in 100 and tapers from 1 m diameter at the high end to 0.5 m at the low end. Quantity of water flowing is 5400 liters per minute. If the pressure at the high end is 70 kPa, find the pressure at the low end. [1+5]

SECTION "C"

[11 marks]

11. What are the type of bonds generally used in brick masonry? Why in your opinion is plastering required in the masonry works? Differentiate between framed structures and load bearing structures. [1+1+2]
12. What do you understand by a Gravity Dam? Explain with necessary sketches. What are the advantages and disadvantages of embankment dam? [2+2]
13. Write in brief about the pile foundation. What do you understand by 53 grade OPC? [2+1]

SECTION "D"

[11 marks]

14. What do you understand by active and passive remote sensing? Classify different types of surveying based on equipment used and nature of field. [2+2]
15. Explain in brief about the topographical map. What is the basic principle of EDM? [2+1]
16. The following bearings were observed with a compass in a traverse ABCDEA. Calculate the interior angles of the traverse and apply the check. [4]

Line	Fore Bearing
AB	N 60° 30' E
BC	S 58° 0' E
CD	N 46° 0' E
DE	S 64° 30' W
EA	N 60° 0' W