Hall Ticket No | | | | | | | | | | | Question Paper Code: ACEB05

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER-I

B.Tech IV Semester End Examinations, May- 2020

Regulations: R18

ENGINEERING GEOLOGY

(Common to CE)

Time: 3 hours **Max. Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

MODULE– I

1.	a)	What is meant by weathering of rocks? Explain in detail different geological agents responsible for weathering of rocks.	**[7M]**
	b)	Explain briefly few case studies of civil engineering failures due to geological drawback.	**[7M]**
2.	a)	Write in detail about the scope of geology and importance of geology in civil engineering.	**[7M]**
	b)	Explain briefly few case studies of civil engineering failures due to geological drawback.	**[7M]**

MODULE – II

3.	a)	Describe the different types of rocks. Give the classification, textureand structure of igneous, sedimentary and metamorphic rocks.	**[7M]**
	b)	Give a detailed account on chemical composition, Physical properties, origin occurrence, engineering behaviour and uses of clay minerals.	**[7M]**
4.	a)	Explain beirfly about the significance of different physical properties in mineral identification.	**[7M]**
	b)	What are sedimentary rocks? Explain in detail the properties of any 4 sedimentary rocks?	**[7M]**

MODULE – III

5.	a)	What is a fault? Discuss the various types of faults and write about the engineering applications.	**[7M]**
	b)	What is joint? Discuss beirfly various types of faults and write about their engineering applications.	**[7M]**
6.	a)	Discuss thoroughly about the types of unconformity. Classify folds and faults and explain how they influence the design of dams.	**[7M]**
	b)	Illustrate with a neat sketches about landslides and their types. What are the various measures to control landslides?	**[7M]**

MODULE – IV

7.	a)	What are the geological considerations necessary in the selection of a Dam Site?	**[7M]**
	b)	Compare and contrast the diffeence between magnitude and intensity of an earthquake.	**[7M]**
8.	a)	Explain in detail important points in mitigating the effects of earthquake on structures.	**[7M]**
	b)	What is the design philosophy adopted for earthquake resistant structure?	**[7M]**

MODULE – V

9.	a)	What is the role of Igneous and metamorphic rocks at the tunnel site?	**[7M]**
	b)	Explain the considerations of different types of rocks at the dam site Construction.	**[7M]**
10.	a)	What are the geological considerations necessary in the selection of Dam site?	**[7M]**
	b)	Outline the geological causes for the failure of dams, with a few Case Histories.	**[7M]**

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

COURSE OBJECTIVES:

The course should enable the students to:

I	Access engineering properties of rock and unconsolidated materials in the characterization of geologic sites for civil work projects and the quantification of processes such as rock slides, soil-slope stability, settlement, and liquefaction.
II	Involves the collection, analysis, and interpretation of geological data and information required for the safe development of civil works.
III	Assessment and mitigation of geologic hazards such earthquakes, landslides, flooding; the assessment of timber harvesting impacts; and groundwater remediation and resource evaluation.

COURSE OUTCOMES (COs):

CO 1	Understand the role of geology in the design and construction process of underground openings in rock.
CO 2	Be able to apply geologic concepts and approaches on rock engineering projects.
CO 3	Be able to identify and classify rock using basic geologic classification systems.
CO 4	Be able to use the geologic literature to establish the geotechnical framework needed to properly design and construct heavy civil works rock projects.
CO 5	Have knowledge of design and construction procedures required to safely control rock behavior in underground openings.

COURSE LEARNING OUTCOMES (CLOs):

ACEB05.01	Know the importance of geology in civil engineering.
ACEB05.02	Distinguish weathered rocks from fresh rocks.
ACEB05.03	Understand the effects of weathering on dams, reservoirs and tunnels.
ACEB05.04	Understand the case histories of failure of some Civil Engineering constructions due to geological draw backs. Identify the minerals based on their physical properties.
ACEB05.05	Identify and classify common minerals, rocks and soils, and understand their significance to different types of engineering projects.
ACEB05.06	Identify and classify rock using basic geologic classification systems
ACEB05.07	Study the minerals by their physical properties, chemical composition, optical properties and X- ray properties.
ACEB05.08	Study the rocks by their physical properties, chemical composition, optical properties and X-ray properties
ACEB05.09	Understand the geological classification of rocks into Igneous, Sedimentary and metamorphic rocks, their identification based on structure and texture.

ACEB05.10	Identify the major types of rock-forming minerals and rock under both field and laboratory conditions.
ACEB05.11	Understand the importance of various associated geological structures like folds, faults, joints and unconformities present at site for foundations.
ACEB05.12	Identify subsurface information and groundwater potential sites through geophysical investigations
ACEB05.13	Remember prediction of hazards and disasters.
ACEB05.14	Posses the Knowledge and Skills for employability and to succeed in national and international level competitive examinations.
ACEB05.15	Understand to select a suitable site for dams and reservoirs to avoid seepage, silting and tilting.
ACEB05.16	Understand internal geological processes (e.g. faults, earthquakes, volcanoes) and how they affect engineering studies.
ACEB05.17	Locate various subsurface mines and rock bodies by applying geophysical investigations.
ACEB05.18	Gravity methods, magnetic methods, Electrical methods, seismic methods, radio metric methods and geothermal methods
ACEB05.19	Understanding of impact of engineering solutions on the society and also will be aware of Contemporary issues.
ACEB05.20	Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels.
ACEB05.21	Possess the Knowledge and Skills for employability and to succeed in national and international level competitive examinations.
ACEB05.22	Determination of shear strength of soil using direct shear test and tri-axial test in various drainage conditions.
ACEB05.23	Recognize the behavior of soil in normal, over and under consolidated soil. Understand the concept of dilatancy in sandy soil.

MAPPING OF SEMESTER END EXAMINATION - COURSE OUTCOMES

SEE Question No		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	ACEB05.01	Know the importance of geology in civil engineering.	CO 1	Understand
	b	ACEB05.02	Distinguish weathered rocks from fresh rocks.	CO 1	Understand
2	a	ACEB05.03	Understand the effects of weathering on dams, reservoirs and tunnels.	CO 1	Understand
	b	ACEB05.04	Understand the case histories of failure of some Civil Engineering constructions due to geological draw backs. Identify the minerals based on their physical properties.	CO 1	Understand
3	a	ACEB05.05	Identify and classify common minerals, rocks and soils, and understand their significance to different types of engineering projects.	CO 2	Understand
	b	ACEB05.06	Identify and classify rock using basic geologic classification systems	CO 2	Remember
4	a	ACEB05.07	Study the minerals by their physical properties, chemical composition, optical properties and X- ray properties.	CO 2	Understand
	b	ACEB05.08	Study the rocks by their physical properties, chemical composition, optical properties and X-ray properties	CO 2	Understand
5	a	ACEB05.09	Understand the geological classification of rocks into Igneous, Sedimentary and metamorphic rocks, their identification based on structure and texture.	CO 3	Understand
	b	ACEB05.10	Identify the major types of rock-forming minerals and rock under both field and laboratory conditions.	CO 3	Understand
6	a	ACEB05.11	Understand the importance of various associated geological structures like folds, faults, joints and unconformities present at site for foundations.	CO 3	Understand
	b	ACEB05.12	Identify subsurface information and groundwater potential sites through geophysical investigations	CO 3	Understand
7	a	ACEB05.13	Remember prediction of hazards and disasters.	CO 4	Understand
	b	ACEB05.14	Posses the Knowledge and Skills for employability and to succeed in national and international level competitive examinations.	CO 4	Understand
8	a	ACEB05.15	Understand to select a suitable site for dams and reservoirs to avoid seepage, silting and tilting.	CO 4	Understand
	b	ACEB05.16	Understand internal geological processes (e.g. faults, earthquakes, volcanoes) and how they affect engineering studies.	CO 4	Understand
9	a	ACEB05.17	Locate various subsurface mines and rock bodies by applying geophysical investigations.	CO 5	Understand
	b	ACEB05.18	Gravity methods, magnetic methods, Electrical methods, seismic methods, radio metric methods and geothermal methods	CO 5	Understand
10	a	ACEB05.19	Understanding of impact of engineering solutions on the society and also will be aware of Contemporary issues.	CO 5	Understand
	b	ACEB05.23	Recognize the behavior of soil in normal, over and under consolidated soil. Understand the concept of dilatancy in sandy soil.	CO 5	Understand

Signature of Course Coordinator **HOD, CE**