



PAKISTAN ENGINEERING COUNCIL

Sample MCQs

Civil Engineering (Environment)/ Environmental Engineering

Please read all the instructions carefully and do not start the paper unless asked to do so.

1. Fill in your particulars (Name, Roll Number, PEC Registration Number, CNIC and Discipline) in BLOCK letters in the space provided.
2. You are not allowed to change your seat during the test.
3. Hand over your answer sheet to the invigilator at the end of each part and keep seated until allowed to leave the centre.
4. The examination is divided into three Parts viz Part-I, Part-II and Part-III, with 30 minutes break.
5. All questions are to be attempted and carry equal marks.
6. Passing marks for each part is 60%, and passing all three parts is mandatory to qualify EPE.
7. Use only the provided pencil to fill completely the correct choice circle on answer sheet.
8. Programmable calculator, laptop, mobile phone, iPod, and any storage device/electronic gadget are not allowed.
9. No extra sheet will be provided; any calculation may be worked out on the back of the paper.
10. No candidate is allowed to indulge in any Law and Order situation to affect the exam process, and responsible(s) will be disqualified.
11. Use of unfair means will also lead to disqualification.

Instructions for Part-I

This part is common to all disciplines, comprising 30 multiple choice questions of one mark each (Total Marks=30) with the duration of two hours.

Instructions for Part-II

This is a discipline based open book breadth examination, comprising 30 multiple choice questions of one mark each (Total Marks=30), with the duration of two hours.

Instructions for Part-III

This is a discipline based open book depth examination comprising 40 multiple choice questions of one mark each (Total Marks=40), with duration of three hours. The candidates will be allowed only for the specialized field / area of practice, for which already applied at the time of application.

Civil Engineering (Environment)/ Environmental Engineering

Part-I

Total Marks: 30

Total Time: 2 hours

Name:	S/o, D/o, w/o:
Roll Number:	PEC Reg#:
CNIC:	Discipline:

Q.1: Quality control is aimed at:

- a. Maintaining the desired quality
- b. Exceeding the desired quality
- c. Continuously improving the quality
- d. Following the quality

Q.2: Which of these is correct with respect to a product developed or a service performed?.

- a. Bad quality is acceptable, but bad grade is not.
- b. Bad grade is acceptable, but bad quality is not.
- c. Neither bad grade nor quality is acceptable.
- d. Grade and quality is the same thing.

Q.3: Project A has an internal rate of return (IRR) of 21 percent. Project B has an IRR of 7 percent. Project C has an IRR of 31 percent. Project D has an IRR of 25 percent. Which of these would be the BEST project?

- a. Project A
- b. Project B
- c. Project C
- d. Project D

Q.4: What characteristic best describes the cost baseline?

- a. Total budget for the project
- b. Time phased budget for the project

- c. Total budget for the project including the contingency budget
- d. Total budget for the project including the contingency budget and the management reserve.

Q.5: Present worth is:

- a. The discounted future cash flows to the present
- b. The compounding present cash flows to the future
- c. The current market value of the investment
- d. The opportunity cost at the present value.

Q.6: The first preferred way to resolve a dispute between the contracting parties is:

- a. Arbitration
- b. Litigation
- c. Negotiation
- d. Mediation

Q.7: Following document define the legal rights and obligations of the parties and may be described as the regulations under which the contract will be performed.

- a. Specifications
- b. General Conditions of Contract
- c. Special provisions
- d. Bill of Quantities

Q.8: The minimum notice period for National Competitive bidding is:

- a. 30 days
- b. 45 days
- c. 35 days
- d. 15 days

Q.9: Tsunamis' is generated by:

- a. Earthquake
- b. Air currents
- c. Tidal waves
- d. Large Ocean waves

Q.10: Globalization has direct impact on:

- a. National security
- b. Economy
- c. Society
- d. All above

Q.11: The passive voice for the sentence “He is writing a letter” is;

- a. A letter is wrote by him
- b. A letter is written by him
- c. A letter is being written by him
- d. A letter is been written by him

Q.12: Choose the correct sentence

- a. He is elder than me
- b. He is older than me
- c. He is ager than me
- d. He is older than I

Q.13: Effective communication is

- a. The transfer of message from sender to receiver
- b. Sending of massage
- c. Receiving of message
- d. The transfer of message from sender to receiver and get the desired response.

Q.14: Body language is form of;

- a. Personality and attitudes
- b. Non verbal communication
- c. Individual preference for expression
- d. The body expression

Q.15: Project feasibility report is aimed at;

- a. Informing the people
- b. Attracting the customer
- c. Justifying the investment
- d. Giving details of resources

Q.16: Research Proposal synopsis is developed at;

- a. Final stage of research
- b. Initial stage of research
- c. Before approval of research proposal
- d. In the middle of research

Q.17: Project monitoring is required:

- a. Before commencement of the project
- b. During implementation of the project
- c. After completion of the project
- d. At any stage of the project deemed necessary

Q.18: Re-appropriation Statement is form of

- a. Progress report
- b. Budget report
- c. Financial report
- d. Normal report

Q.19: PC-III (A) is used for

- a. For weekly progress report of public sector projects
- b. Monthly progress report of public sector projects
- c. Yearly progress report of public sector projects
- d. Quarterly progress report of public sector projects.

Q.20: Acquiring management and leadership skills are _____ for a Professional Engineer

- a. Wastage of time
- b. Not important
- c. Highly important
- d. Not necessary

Q.21: Engineering ethics refers to:

- a. The rules and standards given by an institution for Engineering practice
- b. The rules and regulation relating to obligations and rights of others.
- c. The professional regulation
- d. The rules and standards which govern the conduct of Engineers as professional Engineers.

Q.22: How many commandments are given in PEC Code of Ethics?

- a. 20
- b. 30
- c. 10
- d. 05

Q.23: As per PEC Code of Conduct a member shall report unethical professional practices of an engineer or a member with substantiating data to

- a. Court of Law
- b. Concerned Department
- c. Pakistan Engineering Council
- d. Law enforcing Agency

Q.24: When a member uses designs, plans, specifications, data and notes supplied to him by a client or an employer or are prepared by him in reference to such client or the employer's work such designs, plans, specifications, data and notes shall remain the property of the _____ and shall not be duplicated for any use without the express permission of the _____.

- a. Member, Member
- b. Client, Client
- c. Member, Client
- d. Client, Member

Q.25: As per PEC Code of Conduct to maintain, uphold and advance the honor and dignity of the engineering professional, a member shall do following except:

- a. uphold the ideology of Pakistan
- b. be honest, impartial and serve the country, his employer, clients and the public at large with devotion.
- c. Uphold personal interest first
- d. use his knowledge and skill for the advancement and welfare of mankind

Q.26: Conflicts are faced when:

- a. There are more than one expected outcomes
- b. There are more than one expected benefits and losses
- c. There is choice between two or more moral values each having its own merits.
- d. There are opposing outcomes.

Q.27: An example of a conflict of interest would be:

- a. As a responsible official you make a decision about a contract award that will benefit you personally
- b. You and a functional manager disagree with a task cost estimate
- c. Your sponsor decides to cancel your project because it no longer supports the company strategy
- d. Your personality conflicts with that of a key member of your project team.

Q.28: Adherence to professional ethics is _____ an engineer to society.

- a. Not obligation of
- b. An obligation of
- c. Optional for
- d. None of above

Q.29: While designing a project by an engineer, _____ should be taken into account to protect cultural heritage

- a. All possible alternates
- b. No protection
- c. Minimum protection
- d. No care

Q.30: Close interpersonal relationships are characterized by high intimacy whereas distressed relationships tend to involve reciprocation of _____ behaviour.

- a. positive
- b. negative
- c. normal
- d. casual

Answers:

- 1. a
- 2. b
- 3. c
- 4. b
- 5. a
- 6. c
- 7. a
- 8. d
- 9. a
- 10. d
- 11. c
- 12. b
- 13. d
- 14. b
- 15. c
- 16. c
- 17. b
- 18. c
- 19. b
- 20. c
- 21. d
- 22. c
- 23. c
- 24. b
- 25. c
- 26. c
- 27. a
- 28. b
- 29. a
- 30. b

Part-II (Breadth of discipline)

Total Marks: 30

Total Time: 2 hours

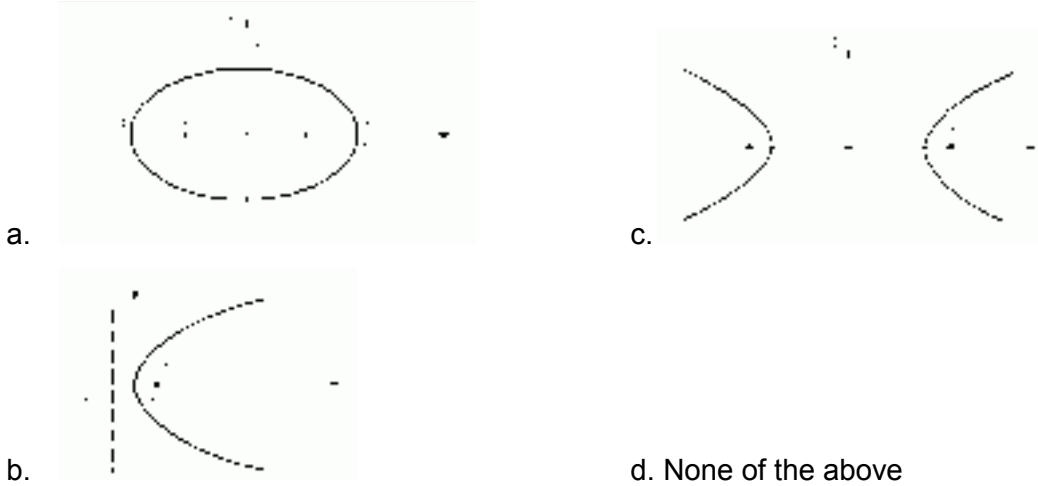
Q.1: An $n \times n$ matrix is said to be symmetric if;

- a. If it is equal to its transpose
- b. If its determinant is equal to zero
- c. If it is of 2nd order
- d. None of the above

Q.2: Mathematically, what is a differential?

- a. A technique used for mathematical modeling.
- b. A method of directly relating how changes in an independent variable affect changes in a dependent variable.
- c. A method of directly relating how changes in a dependent variable affect changes in an independent variable.
- d. None of the above

Q.3: Which of the following is a hyperbola ?



Q.4: Unit of force in SI system (System International) of units is equal to:

- a. Pound
- b. Newton
- c. Kilogram
- d. All

Q.5: Resultant of system of forces can be determined by:

- a. Triangle law
- b. Parallelogram law
- c. $\sqrt{R_x^2 + R_y^2}$
- d. All

Q.6: An automobile weighing 10,000N is driven down a 5° incline at a speed of 90 km/hr when the brakes are applied, causing a constant total braking force of 5000N. What will be the energy of automobile at initial position?

- a. 318.55 kN. m
- b. 553.18 kN. m
- c. 813.55 kN. m
- d. 855.13 kN. m

Q.7: The back sight reading on a BM of RL 500 m is 2.685 m and force sight reading on a point is 1.345 m, the RL of the point is:

- a. 502.685 m
- b. 501.340 m
- c. 501.345 m
- d. 504.030 m

Q.8: When R is the length of the curve (in meters), 'D' is the degree of the curve (in degree) and length of the chord 30 m, then the relation between 'R' and 'D' is:

- a. $R = 1520/D$
- b. $R = 1720/D$
- c. $R = 4500/D$
- d. $R = 5400/D$

Q.9: The brick bond used in Government Sector construction projects in Pakistan is;

- a. Flemish
- b. Double Flemish
- c. English
- d. Fletcher

Q.10: If you planning a clearance in a slushy jungle strata for multistory resort, which equipment you will prefer for site clearance;

- a. Bob cat

- b. JCB
- c. Dozer
- d. Trailer

Q.11: Alloys having more than 2.1% carbon content are referred as:

- a. Steel
- b. Cast iron
- c. Pig iron
- d. Rought iron

Q.12: Minor losses in pipe flow are those

- a. Which have a small magnitude
- b. Which are caused on account of local disturbances produced by such fittings as valves, bends etc.
- c. Caused by friction and are thus also called friction losses
- d. Which depend on the length of pipeline

Q.13: In open channels the flow is under _____ and in pipe flow under _____

- a. atmospheric pressure, pressure higher than atmospheric
- b. atmospheric pressure, pressure lower than atmospheric
- c. atmospheric pressure, atmospheric pressure
- d. hydrostatic, atmospheric

Q.14: Specific Energy is given by $E =$

- a. $y - \frac{\alpha V^2}{2g}$
- b. $y - \frac{V^2}{2g\alpha}$
- c. $y + \frac{V^2}{2g\alpha}$
- d. $y + \frac{\alpha V^2}{2g}$

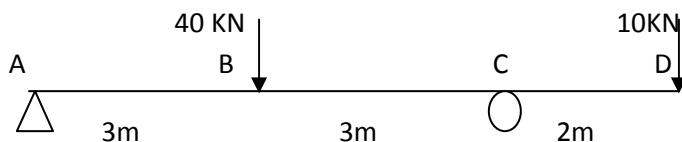
Q.15: Every direct stress is always accompanied by a strain in its own direction and an opposite kind of strain in every direction at right angles to it. Such a strain is known as:

- a. Linear strain
- b. Lateral strain
- c. Volumetric strain
- d. Shear strain

Q.16: Which of the following has highest Poisson's ratio?

- a. Rubber
- b. Steel
- c. Aluminum
- d. Copper

Q.17: For beam loaded as shown in figure below, what will be the location of point from A where bending moment will change sign:



- a. 2.2
- b. 3.0
- c. 5.2
- d. 5.8

Q.18: A plot between rainfall intensity vs time is termed as

- a. hydrograph
- b. mass curve
- c. hyetograph
- d. isohyete

Q.19: A barrage across a river is mainly used for:

- a. river diversion
- b. storage
- c. river diversion and storage
- d. recreation

Q.20: A mean annual runoff of $1 \text{ m}^3/\text{second}$ from a catchment of area 31.54 km^2 represents an effective rainfall of:

- a. 100 cm
- b. 1.0 cm
- c. 100 mm
- d. 3.17 cm

Q.21: If the BOD_5 of waste water is 150 mg/l at $20^\circ C$ the rate constant value is $K = 0.23 \text{ day}^{-1}$. The Ultimate BOD will be:

- a. 102.5 mg/l
- b. 473.7 mg/l
- c. 219.5 mg/l
- d. 47.5 mg/l

Q.22: Pakistan's Review of IEE and EIA Regulations, 2000; includes the listing of projects requiring IEE or EIA in its:

- a. Schedules I and II
- b. Schedules III and IV
- c. Schedules V and VI
- d. Schedules VII

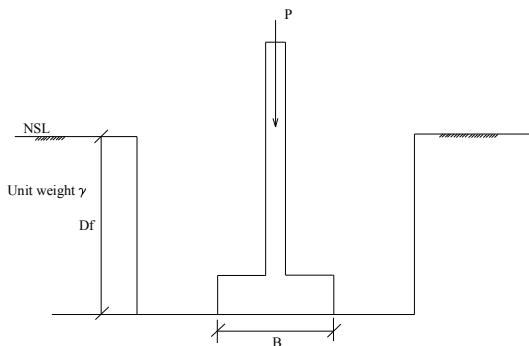
Q.23: The dry density of a moist soil is:

- a. Greater than the bulk density
- b. Equal to the bulk density
- c. Less than the bulk density
- d. There is no specific relation

Q.24: Boussinesq theory is applicable if

- a. Stress in soil is proportional to strain
- b. Stress in soil is independent of strain
- c. Stress in soil is inversely proportional to strain
- d. Stress in soil is proportional to square of the strain

Q.25: The figure shows a footing placed in an excavation which is not backfilled. The net allowable bearing pressure of the soil is q_a . The gross allowable bearing pressure is:



- a. q_a
- b. $q_a + \gamma D_f$
- c. $q_a - \gamma D_f$
- d. None of above

Q.26: Railway Stations at which a railway line or one of its branch lines terminates are called:

- a. Terminal Stations
- b. Junction Stations
- c. Halt Stations
- d. None of the above

Q.27: An Airport Site should be selected having the property:

- a. It should be proximity to residential areas and schools
- b. Smoke and haze should be present
- c. The presence of several airports in a metropolitan area is preferred
- d. None of the above

Q.28: A beam is attached with three fix supports, what will be the degree of indeterminacy of the beam

- a. 0
- b. 3
- c. 6
- d. 9

Q.29: If crushing strength of concrete cylinder is 5345 psi, its tensile strength will be

- a. 1068.00 psi
- b. 534.50 psi
- c. 267.25 psi
- d. 178.16 psi

Q.30: Under application of loads on a reinforced concrete member, if steel attains maximum stress prior to the concrete member is called

- a. Over reinforced section
- b. Balanced section
- c. Under reinforced section
- d. None

Answers:

- 1. a
- 2. c
- 3. c
- 4. b
- 5. d
- 6. a
- 7. b
- 8. c
- 9. c
- 10. c
- 11. b
- 12. b
- 13. a
- 14. d
- 15. b
- 16. a
- 17. c
- 18. c
- 19. a
- 20. a
- 21. a
- 22. a
- 23. c
- 24. a
- 25. a
- 26. a
- 27. d
- 28. c
- 29. b
- 30. c

Part-III (Depth: Environmental Engineering)

Total Marks/ MCQs: 40

Total Time: 3 hours

(Sample MCQs = 20)

Q .1: The Design Period of Ground Water supplies are usually selected as:

- a. 5 Years
- b. 10 Years
- c. 25 Years
- d. 50 Years

Q .2: If the average water consumption of a city is 200 liters per capita day, and the population of city is 5,00,000. The maximum hourly demand of water for the maximum day will be:

- a. 150 million liters
- b. 180 million liters
- c. 270 million liters
- d. 330 million liters

Q .3: In a well planned city, developed recently the layout of distribution pipes system generally adopted is:

- a. Ring system
- b. Grid Iron system
- c. Radial system
- d. All of the above.

Q .4: The minimum width of a sewer trench in mm (millimeter) must be greater than; where D is the external diameter of sewer in mm:

- a. $1.5 D + 100$
- b. $1.5D +300$
- c. $1.5D +400$
- d. $D +1000$

Q .5: Turbidity in water is a physical characteristic of water. It can be easily detected in a glass of water and are usually objectionable for aesthetic reason, when its concentration is in excess of:

- a. 0.1 Turbidity unit
- b. 1.0 Turbidity unit
- c. 4.0 Turbidity unit
- d. 5.0 Turbidity unit

Q .6: If water having a total hardness of 375 mg/l as CaCO₃. The Carbonate Hardness is 200 mg/l as CaCO₃. While the non carbonate hardness is 175 mg/l. as CaCO₃. Its alkalinity concentration will be:

- a. 375 mg/l as CaCO₃.
- b. 200 mg/l as CaCO₃.
- c. 175 mg/l as CaCO₃.
- d. None of them

Q .7: Ground water has to be treated with impurities like hardness, microorganisms and low dissolved Oxygen concentration along with different gases. What will be the proper treatment process from the following options:

- a. Sedimentation; Filtration; Coagulation Flocculation; Disinfection
- b. Aeration; Sedimentation; Softening; Disinfection
- c. Aeration; Sedimentation; lime soda process; Filtration
- d. Screen; Filtration; Softening; Disinfection

Q .8: The normal length of a sedimentation tank to remove suspended particles from water should not be more than _____ time of its Width:

- a. 2
- b. 4
- c. 6
- d. 8

Q .9: If the length of settling tank is 5 m, width is 3 m; depth is 2 m of a rectangular tank with discharge (Q) of 1.0 m³ / second; the settling velocity will be:

- a. 0.033 m/sec
- b. 0.067 m/sec
- c. 0.167 m/sec
- d. 0.200 m/sec

$$\frac{F}{M}$$

Q .10: Select the correct value of ($\frac{F}{M}$) if the flow to a reactor is 0.06 m³/minute. The influent BOD₅ is 85 mg/l and effluent is 40 mg/l. The volume of reactor is 918.0 m³:

- a. 3.400
- b. 1.377
- c. 0.200
- d. 3.400

Q .11: The total weight of solid waste generated in a town is 72,850 lbs/week, whose population is 3500 persons. The unit generation rate of solid waste (kg/capita/day) is:

- a. 1.0
- b. 1.5
- c. 1.3
- d. 2.0

Q .12: The major gases produced from sanitary landfill are due to:

- a. Anaerobic decomposition of biodegradable organic matter
- b. Aerobic decomposition of biodegradable organic matter
- c. Anaerobic decomposition of non-biodegradable organic matter
- d. None of these

Q .13: The minimum area of land desirable for sanitary landfill that is sufficient to operate for at least:

- a. One year
- b. Six months
- c. Nine months
- d. None of these

Q .14: In general, the organic waste material that decomposes rapidly (3 to 5 years) is:

- a. Food waste
- b. News paper
- c. Leaves
- d. All of these.

Q .15: Sanitary land filling is an operation in which waste to be disposed off is compacted and covered with a layer of soil at the end of:

- a. two day's operation
- b. one day's operation
- c. three day's operation
- d. none of these.

Q .16: A preliminary attempt to evaluate environmental impacts in order to determine whether a full-scale environmental impact assessment needed, is called:

- a. Environmental Impact Assessment
- b. Initial Environmental Examination
- c. Environmental Management Plan
- d. Environmental Assessment

Q .17: Screening stage in EIA means:

- a. Determining whether or not an environmental Impact assessment study would be required for a project
- b. Determining the size and nature of the project
- c. Preparing a list of activities to be performed during EIA
- d. Screening the location of the project

Q .18: During EIA, flora and fauna are areas covered under:

- a. Biological environment
- b. Physical-chemical environment
- c. Social environment
- d. Cultural environment

Q .19: The following document is prepared in the light of Asian Development Bank guidelines if the Project Affected Persons exceed 200:

- a. Resettlement plan
- b. Short resettlement plan
- c. Abbreviated resettlement plan
- d. Action plan

Q .20: Deemed approval period in accordance with Pakistan Review of IEE and EIA Regulations, 2000 is:

- a. 1 month from date of filing of IEE/EIA in respect of which confirmation of completeness is issued by EPA
- b. 2 months from date of filing of IEE/EIA in respect of which confirmation of completeness is issued by EPA
- c. 3 months from date of filing of IEE/EIA in respect of which confirmation of completeness is issued by EPA
- d. 4 months from date of filing of IEE/EIA in respect of which confirmation of completeness is issued by EPA

Answers:

- 1.** a
- 2.** c
- 3.** d
- 4.** b
- 5.** d
- 6.** b
- 7.** b
- 8.** b
- 9.** c
- 10.** c
- 11.** c
- 12.** a
- 13.** a
- 14.** d
- 15.** b
- 16.** b
- 17.** a
- 18.** a
- 19.** a
- 20.** d