POST GRADUATE COMMON ENTRANCE TEST – 2011

DATE and TIME	COURSE	SUBJECT
06-08-2011 10:30 am to 12:30 pm	ME / M. Tech / M. Arch / MBA (Infrastructure Management) courses offered by VTU / UVCE / UBDTCE	**ENVIRONMENTAL ENGINEERING**
MAXIMUM MARKS	TOTAL DURATION	MAXIMUM TIME FOR ANSWERING
100	150 Minutes	120 Minutes

MENTION YOUR PGCET NO.	QUESTION BOOKLET DETAILS	
	VERSION CODE	SERIAL NUMBER
	A_2	00000590

DOs
1. Check whether the PGCET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This question booklet is issued to you by the invigilator after the **2nd Bell, i.e. after 10:25 am.**
3. The serial number of this question booklet should be entered on the OMR answer sheet.
4. The version code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'Ts
1. **The timing and marks printed on the OMR answer sheet should not be damaged / mutilated / spoiled.**
2. The **3rd Bell rings at 10:30 am, till then;**
   - Do not remove the seals of this question booklet.
   - Do not look inside this question booklet.
   - Do not start marking on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. This question booklet contains 75 (items) questions and each question will have one statement and four answers. (Four different options / responses.)
2. After the 3rd bell is rung at 10:30 am, remove the seals of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start marking on the OMR answer sheet.
3. During the subsequent 120 minutes :
   - Read each question (item) carefully.
   - Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **only one response** for each question / item.
   - Completely **darken / shade** the relevant circle with a **blue or black ink ballpoint pen against the question number on the OMR answer sheet.**
4. Please note that even a minute unintended ink dot on the OMR answer sheet will also be recognized and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
5. Use the space provided at the bottom on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
6. After the **last bell is rung at 12:30 pm,** stop marking on the OMR answer sheet and affix your **left hand thumb impression** on the OMR answer sheet as per the instructions.
7. Hand over the **OMR answer sheet** to the room invigilator as it is.
8. After separating the top sheet (KEA copy), the invigilator will return the bottom sheet replica (candidate's copy) to you to carry home for self evaluation.
9. Preserve the replica of the OMR answer sheet for a minimum period of ONE year.
10. Only **Non-programmable** calculators are allowed.

Marks Distribution
PART I : 50 Questions carry one mark each (1 to 50)
PART II : 25 Questions carry two marks each (51 to 75)

SEAL

PART - I

Each question carries *one* mark.   50 × 1 = 50

1. Horizontal pocket of relatively warm air surrounded by cooler air is called

    (A) hazardous air pollutant   (B) heat island effect

    (C) temperature inversion   (D) coning.

2. .... is associated with turbulent air during warm season with clear skies.

    (A) Looping   (B) Coning

    (C) Fanning   (D) Lofting.

3. .... are used to control particulate emissions in industrial installations.

    (A) Electrostatic precipitators   (B) Cyclones

    (C) Fabric filters   (D) Venturi scrubbers.

4. Leader of Chipko Movement was

    (A) Sunderlal Bahuguna   (B) Medha Patkar

    (C) Baba Amte   (D) Rajendra Singh.

5. .... authority monitors and controls industrial pollution in India.

    (A) Centre for Science and Environment

    (B) Indian Environmental Association

    (C) State Pollution Control Board

    (D) Indian Water Works Association.

SPACE FOR ROUGH WORK

[P.T.O.

6. Vessels or containers in which chemical and biological reactions occur are called as

   (A) reactors   (B) base material

   (C) crucible   (D) containment.

7. Collecting the particles with less mass density at the fluid surface due to upward movement is called as

   (A) up flow operation   (B) batch flow operation

   (C) sedimentation   (D) flotation.

8. High level radioactive waste can be managed by

   (A) composting   (B) incineration

   (C) neutralization   (D) indefinite deep storage.

9. Biological decomposing of solid wastes is called as

   (A) pulverization   (B) shredding

   (C) composting   (D) recycling and reuse.

10. According to 1998 Indian rules notified (hazardous) which of the following coding is recommended ?

   (A) Yellow, red, green, blue   (B) Yellow, red, blue, black

   (C) Yellow, red, orange, black   (D) Yellow, green, red, white.

11. Population forecast can be made by

   (A) house to house survey   (B) geometrical increase method

   (C) statistical data   (D) annual population census.

SPACE FOR ROUGH WORK

12. Kuichlings formula for computing fire demand is

(A) $3182 \sqrt{P}$ (B) $3189 \sqrt{P}$

(C) $5663 \sqrt{P}$ (D) $5664 \sqrt{P}$.

13. Permissible limit for nitrates in drinking water is

(A) 75 mg/L   (B) 45 mg/L

(C) 200 mg/L   (D) 5 mg/L.

14. Aeration removes .... from water.

(A) taste and odour caused due to gases and organic decomposition

(B) heavy metals and suspended matter

(C) biological impurities

(D) chemical and biological characteristics.

15. Flow through period is defined as the

(A) average time required for a batch of water to pass through settling tank

(B) actual time taken by the batch of water to pass through settling tank

(C) theoretical time taken by the batch of water to pass through the water treatment plant

(D) theoretical time taken to flow from the source of water to treatment plant.

16. .... are major players in phosphorous cycle.

(A) Human beings and fish   (B) Human beings and marine birds

(C) Fish and marine birds   (D) Animals and fish.

SPACE FOR ROUGH WORK

17. The largest reservoir of nitrogen in our planet is

   (A) oceans   (B) atmosphere

   (C) biosphere   (D) fossil fuels.

18. Tendency of pollutants to become concentrated in successive trophic levels is known as

   (A) Bioremediation   (B) Biomagnification

   (C) Biopiracy   (D) Biorhythm.

19. A trophic level refers to

   (A) area in the tropics

   (B) an organism's position in a food chain

   (C) an organism's position in an ecosystem

   (D) an organism's position in a biome.

20. Water Hammer phenomenon is described as

   (A) pressure waves travelling back and forth in a pipe line

   (B) pressure waves generated due to external impact on pipe line

   (C) pressure waves generated due to electrical charges

   (D) pressure waves generated due to overloading.

21. Photoautotrophic microorganisms are based on .... energy source.

   (A) light   (B) inorganic oxidation

   (C) reduction reaction   (D) organic reduction.

SPACE FOR ROUGH WORK

22. Mesophillic bacteria have a typical temperature range of .... °C.

(A)   – 10 to 30

(B)   20 to 80

(C)   20 to 50

(D)   35 to 75.

23. Conversion of nitrate nitrogen biologically to nitrogen gas in the absence of oxygen is known as

(A)   denitrification

(B)   nitrification

(C)   anaerobic nitrification

(D)   anaerobic process.

24. The disease causing bacteria are called

(A)   aerobic bacteria

(B)   pathogenic bacteria

(C)   non-pathogenic bacteria

(D)   facultative bacteria.

25. Minamata disease is caused due to

(A)   consumption of lead polluted water

(B)   consumption of methyl-mercury contaminated fish

(C)   consumption of arsenic polluted water

(D)   consumption of zinc contaminated livestock.

26. .... are some of the tools for sustainable management.

(A)   EIA and LCA

(B)   Treatment technologies

(C)   CPM and PERT

(D)   Characterization and analysis.

27. The first Environmental Protection Act to be enacted in India was

(A)   Wildlife Protection Act

(B)   Air Act

(C)   Noise Act

(D)   Environmental Pollution Act.

SPACE FOR ROUGH WORK

[P.T.O.

28. Environmental audit consists of

   (A) comprehensive audit

   (B) pre- and post-audit, audit at site

   (C) management procedure evaluation

   (D) selective audit.

29. Chernobyl nuclear disaster occurred in the year

   (A) 1984

   (B) 1985

   (C) 1986

   (D) 1987.

30. The observed global population growth curve is

   (A) linear

   (B) exponential

   (C) sinusoidal

   (D) curvilinear.

31. Biomedical waste can be managed by subjecting it to

   (A) chemical process and thermal process

   (B) physical process and biological process

   (C) chemical process only

   (D) biological process only.

32. Low level radioactive wastes are produced frequently by

   (A) inferior type radioactive material

   (B) day to day operations of nuclear power plants

   (C) lean operations in industries

   (D) processing enriched uranium.

33. Reverse osmosis is a type of

   (A) dead end filtration system

   (B) cross flow filtration system

   (C) ion exchange method

   (D) microfiltration.

SPACE FOR ROUGH WORK

34. Bangalore method of composting involves

 (A) Aerobic decomposition of waste   (B) Anaerobic decomposition of waste

 (C) Decomposition of waste   (D) Segregation of garbage.

35. Constructed wetlands could be an ideal low-cost water treatment system for Indian condition as

 (A) tropical climate is ideal for working of the system

 (B) waste water in India is homogeneous

 (C) other types of wetlands are unsuitable

 (D) it is the only alternative.

36. Schmutzdecke is a characteristic feature of

 (A) pressure filters   (B) slow sand filters

 (C) up flow filters   (D) rapid sand filters.

37. Operational trouble in filter may be due to

 (A) formation of mud balls and air binding

 (B) short circuiting

 (C) overloading

 (D) low cost materials.

38. Stabilization ponds are employed as

 (A) secondary treatment   (B) primary treatment

 (C) preliminary treatment   (D) tertiary treatment.

SPACE FOR ROUGH WORK

39. Spray towers are an example for

(A) absorption units   (B) leaching units

(C) filtration units   (D) disinfection units.

40. .... is a functional expression for the variation of adsorption with concentration of adsorbate in bulk solution at a constant temperature.

(A) Absorption isotherm   (B) Adsorption isotherm

(C) Adsorption equilibrium   (D) Absorption unit.

41. Centrifugal action in a centrifugal pump increases

(A) both pressure and absolute velocity of the fluid

(B) centrifugal action only

(C) impact velocity

(D) hydraulic pressure.

42. .... is an example for positive displacement pump.

(A) Reciprocating pump   (B) Hydraulic ram

(C) Jet pump   (D) Air lift pump.

43. Generally total head of water for medium head pumps is

(A) 0 m to 15 m   (B) 25 m to 50 m

(C) 55 m to 75 m   (D) 125 m to 175 m.

44. Types of ground water aquifers are

(A) unconfined and confined   (B) stratosphere and hydrosphere

(C) pervious and hydrosphere   (D) shallow and confined.

SPACE FOR ROUGH WORK

45. Yield of a well can be determined by

   (A) recuperation test

   (B) drilling

   (C) ground water analysis

   (D) sounding tests.

46. The most important source of EMR is

   (A) Water

   (B) Natural gas

   (C) Natural biofuel

   (D) Sun.

47. Carbon content is higher in

   (A) Soil

   (B) Atmosphere

   (C) Water

   (D) Living matter.

48. Terminology not associated with vertical structure of forest is

   (A) canopy

   (B) understory

   (C) forest floor

   (D) first floor.

49. The primary producers in a forest ecosystem are

   (A) chlorophyll containing trees and plants

   (B) herbivores

   (C) carnivores

   (D) bacteria and other organisms.

50. Eutrophication is

   (A) an improved water quality status of lakes

   (B) the result of accumulation of plant nurients in water bodies

   (C) a process in the carbon cycle

   (D) a water purification technique.

SPACE FOR ROUGH WORK

[P.T.O.

PART - II

Each question carries *two* marks. 25 × 2 = 50

51. Discharge per unit drawdown is defined as

    (A) yield
    (B) specific capacity
    (C) recuperation
    (D) draw down.

52. Well development can be acheived by

    (A) Surging
    (B) Watershed development
    (C) Drilling deep wells
    (D) Sanitary protection of wells.

53. Kachcha well is

    (A) built of low cost materials

    (B) a temporary well of a very shallow depth

    (C) a rural well

    (D) a well built in tropical climates.

54. Formula, which is most appropriate to the design of pressure pipes is

    (A) Darcy-Weisbach formula
    (B) Manning's formula
    (C) Chezy's formula
    (D) Dupuit's formula.

55. Maximum pressure which a pipe can withstand without any leakage during hydrostatic pressure test is called the

    (A) working pressure
    (B) test pressure
    (C) design pressure
    (D) hydrostatic pressure.

56. Bacteria surviving on energy generated through chemical reactions alone are called

    (A) photoautotrophs
    (B) chemoautotrophs
    (C) autotrophs
    (D) phtotosynthesis.

SPACE FOR ROUGH WORK

57. Bacteria genera responsible for nitrification are

    (A)   Nitrosomonas and fungi   (B)   Nitrobacter

    (C)   Nitrosomonas and bacteria   (D)   Nitrosomonas and nitrobacter.

58. .... is not a source of organic residue in a nitrogen cycle.

    (A)   Decay of plants and animals   (B)   Excreta of human beings

    (C)   Water   (D)   Micro-organisms.

59. Respiration and photosynthesis are keywords related to

    (A)   Nitrogen cycle   (B)   Sulphur cycle

    (C)   Carbon cycle   (D)   Hydrological cycle.

60. Presence of high levels of nitrates in water causes

    (A)   dehydration   (B)   obesity

    (C)   blood disorders   (D)   fluorosis.

61. Likely characteristic of hazardous waste is

    (A)   Alkalinity and Acidity   (B)   Ignitability and Reactivity

    (C)   Fermentation   (D)   Putrescible and Biodegradable.

62. Pesticides can be classified into .... categories.

    (A)   four   (B)   three

    (C)   six   (D)   eight.

63. Acid Rain causes

    (A)   acidification of water bodies, loss of soil fertility

    (B)   increased rainfall

    (C)   reduction in rainfall

    (D)   increase in temperature.

SPACE FOR ROUGH WORK

64. .... is used for measuring **thickness of ozone layer.**

(A)   Decibels unit   (B)   Dobson unit

(C)   Centimetre scale   (D)   Pivot tube.

65. Universal Declaration of Human Rights was proclaimed by UN in the year

(A)   1946   (B)   1947

(C)   1948   (D)   1949.

66. A food web consists of

(A)   a portion of food chain

(B)   producers, consumers and decomposers

(C)   interlocking food chains

(D)   a set of similar consumers.

67. The concentration of carbon in living matter is almost 100 times greater than its concentration in the earth because

(A)   carbon is produced by the living cells

(B)   living forms extract carbon from non-living environment

(C)   carbon is magnified in living cells

(D)   carbon cannot be recycled.

68. .... is a Biodiversity hot spot in India.

(A)   Gulf of Mannar   (B)   Western Ghats

(C)   Sunderbans   (D)   Bay of Bengal.

69. .... is an example for impulse pump.

(A)   Hydraulic ram   (B)   Jet pump

(C)   Centrifugal pump   (D)   Airlift pump.

SPACE FOR ROUGH WORK

70. Electric Horsepower is given by the ratio of

    (A)   BHP and horsepower   (B)   BHP and motor efficiency

    (C)   BHP and output   (D)   BHP and input.

71. A sluice valve is also known as

    (A)   air-inlet valve   (B)   scour valve

    (C)   gate valve   (D)   relief valve.

72. Tolerance limit for discharge of sewage to inland surface waters as per IS 2490 - 1974 for total suspended solids is

    (A)   30 mg/L   (B)   100 mg/L

    (C)   70 mg/L   (D)   600 mg/L.

73. The Water (Prevention and Control of Pollution) Cess Act was passed in the year

    (A)   1974   (B)   1975

    (C)   1977   (D)   1978.

74. The process of carrying refuse and dumping into low lying areas earmarked under an engineered operation is called

    (A)   disposal of municipal solid waste   (B)   sanitary landfilling

    (C)   recycling   (D)   organic composting.

75. Damage of living cells is assessed by using

    (A)   MLSS   (B)   RBE

    (C)   MCSS   (D)   Half-life.

SPACE FOR ROUGH WORK