DF-3042
Second Year B. Sc. (Sem. III) Examination
March / April – 2016
Non-Renewable Energy
(New Course)

Time : 2 Hours] [Total Marks : 50

(1) Fill up strictly the details of signs on your answer book.
Name of the Examination :
SECOND YEAR B. SC. (SEM. 3)
Name of the Subject :
NON-RENEWABLE ENERGY
Subject Code No. 3 0 4 2 Section No. 1 2 3 4 5 6

(2) There are total 50 questions in this paper. All are compulsory.

(3) Each question carries 1 mark. Marks will be deducted for a wrong answer.

O.M.R. Sheet जरूर अपनी अपनी सूचनाओ आपेक्ष
O.M.R. Sheet-वं व्यक्त करें आपेक्ष.
Important instructions to fill up O.M.R. Sheet are given on back side of the provided O.M.R. Sheet.

DF-3042_D ] 1 [ Contd...
1. Which power station located at Tarapur?
   (A) Thermal
   (B) Gas based
   (C) Nuclear
   (D) Atomic

2. Where gas based power station is located in Gujarat?
   (A) Dhuvaran
   (B) Gandhinagar
   (C) Kandla
   (D) Kavas

3. For controlled chain reaction in nuclear reactor, Ke = ________.
   (A) 1
   (B) greater than 1
   (C) Zero
   (D) less than 1
4. In fission reaction how much energy released by one fission of atom?
(A) 200 MeV
(B) 22.7 MeV
(C) 6.6 MeV
(D) 26.7 MeV

5. Give full name of BWR
(A) Balmer Water Reactor
(B) Boing Water Reactor
(C) Beta Water Reactor
(D) Boiling Water Reactor

6. Which substance is used to absorb the neutron in nuclear reactor?
(A) Sodium
(B) Heavy Water
(C) Zinc
(D) Cadmium

7. How many percentage of $^{238}\text{U}$ in natural uranium?
(A) 99.3%
(B) 30%
(C) 15%
(D) 0.7%
8. Which of the unit is used to measure the large quantity of petroleum?
(A) Liter
(B) Cubic feet
(C) Tone
(D) Barrel

9. कुछ तालाब में मुख्यतः कौन सा अम्ल होता है?
(A) ईथेन
(B) थ्रोपेन
(C) बुटेन
(D) मिथेन

Natural gas contain mainly _______.
(A) Ethen
(B) Propen
(C) Buten
(D) Mithen

10. भारत में _______ अंश में कोयला मोड़ने का प्रचलित आदेश है।
(A) बालुआ
(B) बीरभूम
(C) जलपाइगुरी
(D) राणीपंजाब

Large area of coal in India is _______.
(A) Bakura
(B) Beerbhoom
(C) Jalpaiguri
(D) Raniganj
11 Large quantity of deuterium is obtain from _____
(A) Earth
(B) Wind
(C) None of theses
(D) Sea

12 Which of the following is used to made Thermoplastic?
(A) Mithen
(B) Propen
(C) Buten
(D) Etheline

13 Which of the following fuel is not fossil?
(A) Uranium
(B) Petroleum
(C) Natural gas
(D) Coal
14. Which neutron shadow is the base of the shadow on a scale of 1 to 10? 
(A) Tectonic plate shadow cast in the shadow of the shadow
(B) Earthquake shadow shadow in shadow
(C) Reflection shadow of the shadow of the shadow
(D) Shadow shadow shadow shadow

Fast neutron can easily slowed down by
(A) Passing them through water
(B) Elastic collision with heavy nuclei
(C) Applying strong electric field
(D) The use of lead sheilding

15. Which of the following is the best nuclear fuel for a reactor? 
(A) Plutonium-239
(B) Neptunium-239
(C) Thorium-236
(D) Uranium-236

16. Neutrino has a _____.
(A) Massless but has spin.
(B) Massless but has mass nearly that of a proton.
(C) Charged like an electron and has spin.
(D) Has no charge and no spin.
17. Cadmium rods are used in a nuclear reactor for
   (A) Speeding up slow neutrons
   (B) Absorbing neutrons
   (C) Regulating the power level of the reactor
   (D) Slowing down fast neutrons

18. How much energy is released when one amu is converted into energy?
   (A) 200 MeV
   (B) 931 MeV
   (C) $10^6$ MeV
   (D) 1 MeV

19. Choose the correct statement $^{238}\text{U}_{92}$ has
   (A) 92 protons and 146 electrons
   (B) 92 neutrons and 146 electrons
   (C) 92 proton and 146 neutrons
   (D) 92 electrons and 146 neutrons
20  The nuclear density is order of ________.
(A) $10^{10}$ kg m$^{-3}$
(B) $10^{17}$ kg m$^{-3}$
(C) $10^{34}$ kg m$^{-3}$
(D) 1000 kg m$^{-3}$

21  The first scientist who suggested that most of the mass of an atom is concentrated in its nucleus is
(A) Rutherford
(B) Bohr
(C) Chadwick
(D) Thomson

22  The rest mass energy (in MeV) of electron is
(A) 1.0
(B) 200
(C) 931
(D) 0.51

23  The ratio of atomic volume and nucleus volume is of order of ________.
(A) $10^{-10}$
(B) $10^{12}$
(C) $10^{10}$
(D) $10^{-15}$
24 The size of the nucleus is of the order of
(A) $10^{-14}$ m
(B) $10^{-19}$ m
(C) $10^{-3}$ m
(D) $10^{-10}$ m

25 ______ conserved in nuclear reaction.
(A) Only energy
(B) Only momentum
(C) All of them
(D) Only charge

26 Neutron is discovered by ______
(A) Fermi
(B) Rutherford
(C) Mittner
(D) Chedwich

27 Which of the following substance is not used as moderator?
(A) Heavy water
(B) Baralium
(C) Liquid sodium metal
(D) Graphite
28. Which of the following is better projectile particle for bombarding on nucleus?
(A) Neutrino
(B) Electron
(C) Neutron
(D) $\alpha$-particle

29. LMFBRTu pūnā nām āapō.
(A) Barīk metul kast shēdē shēder rékēdēr
(B) La-va metul kast shēdē shēder rékēdēr
(C) Līkīwīlī metul kast bīmē rékēdēr
(D) Pravādā-metul kast shēdē shēder rékēdēr

Give full name of LMFBRT _______
(A) Light Metal Fast Breeder Reactor
(B) Length Metal Fast Breeder Reactor
(C) Liquid Metal Fast Beam Reactor
(D) Liquid Metal Fast Breeder Reactor

30. Bāratmā prāsam nūkīvāpṣā pāpār stēshān kāpān āagnān bhānāvāmā āāpyū?
(A) Vānkbroī
durāpūr
(C) Kōta
(D) Kākrāpar

Where first nuclear power station is established in India?
(A) Vankbori
(B) Tarapur
(C) Kota
(D) Kakrapar
31. Average radius of nucleus, \( R = \) \( \frac{1}{R_O A^3} \)

(A) \( R_O A^3 \)

(B) \( \frac{R_O}{A^3} \)

(C) \( R O_A \)

(D) \( R_O \)

32. Give the full name of AEC

(A) Atomic Energy Company

(B) Automatic Energy Corporation

(C) Automatic Energy Commission

(D) Atomic Energy Commission

33. Hydrogen nucleus consists of only one _______.

(A) Neutron

(B) Proton

(C) Proton-Neutron

(D) Electron
34  Which of the condition is required to nucleus for natural radioactive?
(A) $Z > 60$
(B) $Z > 70$
(C) $Z > 83$
(D) $Z > 50$

35  What is the radius of nucleus of atomic mass 216?
$R_0 = 1.2 \times 10^{-13}$ cm
(A) $1.47 \times 10^{-13}$ cm
(B) $14.7 \times 10^{-13}$ cm
(C) $0.72 \times 10^{-13}$ cm
(D) $7.20 \times 10^{-13}$ cm

36  Which physical quantity has the unit electron volt?
(A) Potential difference
(B) Energy
(C) Charge
(D) Voltage of electron

37  Equivalent energy of 1 kg substance _______ J.
(A) $9 \times 10^{14}$
(B) $15 \times 10^{11}$
(C) $9 \times 10^{20}$
(D) $9 \times 10^{16}$
38. What is the value of charge of $\gamma$-rays?
   (A) $-e$
   (B) $+2e$
   (C) $0$ (Zero)
   (D) $+e$

39. Which of the following particle is deflected in electric field?
   (A) $\gamma$-particle
   (B) X-rays
   (C) Neutron
   (D) $\alpha$-particle

40. ______ is an unit of curie.
   (A) half-life
   (B) radioactivity
   (C) Intensity of $\gamma$-rays
   (D) energy of $\gamma$-rays
41. Which of the following event is radioactivity?
(A) Atomic
(B) Chemical
(C) Physical
(D) Nuclear

42. Which of the following radiation is not radioactive radiation?
(A) β-particle
(B) γ-particle
(C) neutron
(D) α-particle

43. \(1 \text{ mC}_i = \quad \text{ _____ Becquerel} \) (Becquerel)
\(1 \text{ mC}_i = \quad \text{ _____ Becquerel} \)
(A) \(3.7 \times 10^7\)
(B) 3.7
(C) \(3.7 \times 10^{-7}\)
(D) \(3.7 \times 10^4\)
44. The mass defect of stationary nucleus is _______.
   (A) positive  
   (B) negative  
   (C) less than unstable nucleus  
   (D) zero

45. Binding energy of nucleus arises due to _______.
   (A) atomic mass  
   (B) mass of neutron  
   (C) mass defect of nucleus  
   (D) mass of nucleus

46. On which principle Hydrogen bomb working?
   (A) Uncontrolled chain reaction  
   (B) Nuclear fission  
   (C) Nuclear fussion  
   (D) Controlled chain reaction
47 1 eV = _______ J.
    (A) $1.6 \times 10^{19}$
    (B) $1.6 \times 10^{-27}$
    (C) $1.6 \times 10^{-10}$
    (D) $1.6 \times 10^{-19}$

48 $^{79}\text{Au}^{197}$-नुक्लियस साठे नीच्या जोडका जोडे.
Make following pair for nucleus of $^{79}\text{Au}^{197}$

(1) प्रोटोनाची संख्या (Number of proton)   (P) 118
(2) न्यूट्रॉनाची संख्या (Number of neutron)   (Q) 197
(3) न्यूट्रॉन-अनुक्रमाची संख्या (Number of nucleon) (R) $1.264 \times 10^{-17}$ C
(4) कुळ विद्युतज्ञ (Total charge)      (S) 79
    (A) 1–P, 2–Q, 3–R, 4–S
    (B) 1–R, 2–P, 3–Q, 4–S
    (C) 1–S, 2–P, 3–Q, 4–R
    (D) 1–S, 2–R, 3–Q, 4–P

49 कंधु द्रवी शीतक तरीके वर्षांतून नाही?
    (A) बायु
    (B) पाणी
    (C) प्रवाणी सोडियम पायु
    (D) बोरन

Which material is not used as coolant?
    (A) Gas
    (B) Water
    (C) Liquified sodium metal
    (D) Boron

50 रःर्डर्थ नुक्लियसाच्या निर्माण _______ ना कमी दोऱ्यांना जल्लायल्यां.
Rutherford states the radius of nucleus _______.
    (A) 1 fm
    (B) $10^{15}$ fm
    (C) $10^{13}$ fm
    (D) $10^{-15}$ fm