

Itemcode : **RS1001**

**Q1:** The dominant method of interaction for therapeutic energy range is:

- A** Photo electric effect
- B** Compton effect
- C** Pair production
- D** Photo nuclear disintegration

Correct Ans: **B**

Itemcode : **RS1002**

**Q2:** Dose under the shielded portion is computed using:

- A** Primary dose only
- B** Both primary and scatter dose
- C** HVL of the block
- D** TPR 10/20 ratio

Correct Ans: **B**

Itemcode : **RS1003**

**Q3:** Backscatter factor (BSF):

- A** Is the same as TAR at depth of maximum dose
- B** Can be measured at any depth
- C** Increases with decrease in field size
- D** Increases with increase in energy

Correct Ans: **A**

Itemcode : **RS1004**

**Q4:** Annual dose limits:

- A** The dose limit for public is 1mGy per year
- B** A radiation worker can also receive 30 mSv in a single year provided the cumulating dose over a period of 5 years do not exceed 50mSv
- C** The dose limit for trainees below 18 years is 20 mSv per year
- D** A radiation worker can receive 20 mSv /yr

Correct Ans: **D**

Itemcode : **RS1005**

**Q5:** The parameters that vary during IMAT are:

- A** Variable gantry rotation, MLC and dose rate
- B** Variable gantry motion with fixed MLC and dose rate
- C** Fixed gantry angles with variable MLC and dose rate

<b>D</b>	Fixed dose rate with variable MLC and gantry rotation
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Correct Ans: **A**

Itemcode : **RS1006**

**Q6:** Intra fraction motion can be corrected using:

<b>A</b>	Respiratory gating
<b>B</b>	Internal marker placed in the target
<b>C</b>	External fiducial kept on body surface
<b>D</b>	All the above

Correct Ans: **D**

Itemcode : **RS1007**

**Q7:** Adaptive radiotherapy corrects:

<b>A</b>	Tumour shrinkage / patient weight loss during the course of treatment
<b>B</b>	Intra fraction motion
<b>C</b>	Respiratory motion
<b>D</b>	All the above

Correct Ans: **D**

Itemcode : **RS1008**

**Q8:** Interaction of radiation with matter:

<b>A</b>	Photons lose energy in small increments, thus gradually slowing down in the medium
<b>B</b>	The threshold energy for pair production is 0.511 MeV
<b>C</b>	In a photoelectric interaction is independent on atomic number
<b>D</b>	Compton scattering is proportional $Z^3$

Correct Ans: **A**

Itemcode : **RS1009**

**Q9:** The penumbra of external therapy beams:

<b>A</b>	Decreases with increase in source size
<b>B</b>	Decreases with increases source to diaphragm distance (SDD)
<b>C</b>	Increases with increase in source to skin distance (SSD)
<b>D</b>	Decrease with diaphragm to patient distance

Correct Ans: **B**

Itemcode : **RS1010**

**Q10:** Which of the following statement is true for 'Wedge'?

<b>A</b>	Angle of the isodose tilt is measured along the beam central axis at reference depth in a phantom
<b>B</b>	Wedge transmission factor does not vary with depth

<b>C</b>	A wedge filter in the beam path leads to beam hardening
<b>D</b>	All the above
Correct Ans: <b>D</b>	

<u>Itemcode</u> : <b>RS1011</b>	
<b>Q11:</b> Accelerating wave guide is made up of:	
<b>A</b>	Copper
<b>B</b>	Aluminum
<b>C</b>	Glass
<b>D</b>	Tungsten
Correct Ans: <b>A</b>	

<u>Itemcode</u> : <b>RS1012</b>	
<b>Q12:</b> Flattening filter:	
<b>A</b>	Position in the beam path is not very critical
<b>B</b>	Do not change the spectra of the photon beam
<b>C</b>	Get a flat beam profile at the clinical depth for photon beam
<b>D</b>	Get a flat beam profile at the clinical depth for electron beam
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1013</b>	
<b>Q13:</b> Bending magnets	
<b>A</b>	Helps in acceleration of electron
<b>B</b>	To bend the photon beams
<b>C</b>	To bend the electron beam
<b>D</b>	Isolates the RF wave
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1014</b>	
<b>Q14:</b> The depth in cm at which 85% of dose occurs for an electron beam is approximately at	
<b>A</b>	$E_0/2$ MeV
<b>B</b>	$E_0/3$ MeV
<b>C</b>	$E_0/4$ MeV
<b>D</b>	None of the above
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1015</b>	
<b>Q15:</b> The rate at which the electron beam loses its energy in water is	
<b>A</b>	2 MeV/cm

<b>B</b>	$E_0/3$ MeV
<b>C</b>	$E_0/4$ MeV
<b>D</b>	None of the above
Correct Ans: <b>A</b>	

Itemcode : <b>RS1016</b>	
<b>Q16:</b> The purpose of placing perspex degrader before the patient during whole body radiation is to	
<b>A</b>	Attenuate electron beam
<b>B</b>	Scatter electron beam
<b>C</b>	Reduce electron energy
<b>D</b>	Reduce electron energy and scatter electron beam
Correct Ans: <b>C</b>	

Itemcode : <b>RS1017</b>	
<b>Q17:</b> To calculate radiation dose at depth with SSD technique, we need	
<b>A</b>	PDD
<b>B</b>	TAR
<b>C</b>	SAR
<b>D</b>	TMR
Correct Ans: <b>A</b>	

Itemcode : <b>RS1018</b>	
<b>Q18:</b> Choose the correct formula to calculate the wedge angle $\theta$ for two beams at hinge ( $\phi$ )	
<b>A</b>	$\theta = 90^\circ + \phi/2$
<b>B</b>	$\theta = (90^\circ - \phi)/2$
<b>C</b>	$\theta = 90^\circ - \phi/2$
<b>D</b>	$\theta = (90^\circ + \phi)/2$
Correct Ans: <b>C</b>	

Itemcode : <b>RS1019</b>	
<b>Q19:</b> Shielding block of 5 HVL will approximately transmit the radiation dose at $d_{max}$ which is	
<b>A</b>	3- 5%
<b>B</b>	> 5%
<b>C</b>	= 5%
<b>D</b>	<3%
Correct Ans: <b>A</b>	

Itemcode : **RS1020**

**Q20:** Collimator size in cyber knife is defined at

**A** 100 cm

**B** 30 cm

**C** 80 cm

**D** 20 cm

Correct Ans: **C**

Itemcode : **RS1021**

**Q21:** In SBRT the dose fraction schedule in primary lung lesion is all except

**A** 3f X 20 Gy

**B** 4f X 12 GY

**C** 5f X 10 GY

**D** 6f X 10 Gy

Correct Ans: **D**

Itemcode : **RS1022**

**Q22:** In cyber knife respiratory tracking system used is

**A** Breath holding method

**B** Respiratory gating method

**C** Synchrony tracking method

**D** Forced shallow breathing with abdominal compression

Correct Ans: **C**

Itemcode : **RS1023**

**Q23:** Commonly used DVH in External beam radiotherapy is

**A** Differential DVH

**B** Cumulative DVH

**C** Natural DVH

**D** None of them

Correct Ans: **B**

Itemcode : **RS1024**

**Q24:** According to the AAPM TG-40, the tolerance for x-ray or electron output constancy check with a field instrument using temperature and pressure correction is specified at plus or minus:

**A** 1%

**B** 2%

**C** 3%

<b>D</b>	4%
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1025</b>	
<b>Q25:</b> Because electrons scatter readily in air	
<b>A</b>	They are removed before they strike the target
<b>B</b>	Cones extending close to the patient's skin are used
<b>C</b>	Scattering foil is used
<b>D</b>	All above
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1026</b>	
<b>Q26:</b> Clinical proton generators consist of	
<b>A</b>	Linacs
<b>B</b>	Microtrons
<b>C</b>	Synchrotrons
<b>D</b>	Betatrons
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1027</b>	
<b>Q27:</b> Collimator in a high energy X ray beam	
<b>A</b>	Flattens the beam at a specified depth in tissue
<b>B</b>	Defines the beam
<b>C</b>	Determines the dose rate
<b>D</b>	Increase the energy of the beam
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1028</b>	
<b>Q28:</b> Electron current in the x-ray mode versus electron mode in a linear accelerator is approximately	
<b>A</b>	10:1
<b>B</b>	100:1
<b>C</b>	1000:1
<b>D</b>	1:1000
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1029</b>	
<b>Q29:</b> If the range of a 100 MeV proton in water is 7.6 cm, what would the range (in cm) of a deuteron with same initial velocity be?	
<b>A</b>	3.8
<b>B</b>	7.6

<b>C</b>	15.2
<b>D</b>	30.4
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1030</b>	
<b>Q30:</b> Insertion of aluminium, copper, and tin filters into x ray beam causes	
<b>A</b>	Low-energy x-rays to be absorbed
<b>B</b>	The kVp to increase
<b>C</b>	An unnecessary dose on the skin surface
<b>D</b>	The dose to increase
Correct Ans: <b>A</b>	

<u>Itemcode</u> : <b>RS1031</b>	
<b>Q31:</b> Orthovoltage x-ray beams are generally	
<b>A</b>	More penetrating than those of linear accelerators
<b>B</b>	More penetrating than superficial beams
<b>C</b>	Equal to superficial beams in penetration
<b>D</b>	Equal to or less penetrating than superficial x rays
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1032</b>	
<b>Q32:</b> Orthovoltage x-ray units usually operate in the range of	
<b>A</b>	20 to 150 kVp
<b>B</b>	150 to 500 kVp
<b>C</b>	200 to 1200 kVp
<b>D</b>	Any kVp below 200 kVp
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1033</b>	
<b>Q33:</b> Radiation therapy units operating at approximately 50 to 120 kVp are referred to as	
<b>A</b>	Linear accelerators
<b>B</b>	Orthovoltage units
<b>C</b>	Superficial units
<b>D</b>	Betatrons
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1034</b>	
<b>Q34:</b> The regular photon beam from a linear accelerator is intercepted by	
<b>A</b>	A copper filter that hardens the beam

<b>B</b>	Ionization chambers and a flattening filter
<b>C</b>	A scattering foil and an ionization chamber
<b>D</b>	A brass filter
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1035</b>	
<b>Q35:</b> What is the approximate microwave pulse frequency in medical linear accelerator	
<b>A</b>	100MHz
<b>B</b>	300MHz
<b>C</b>	1,000MHz
<b>D</b>	3,000 MHz
Correct Ans: <b>D</b>	

<u>Itemcode</u> : <b>RS1036</b>	
<b>Q36:</b> Which of the following linac components require(s) to be cooled?	
<b>A</b>	Klystron or magnetron
<b>B</b>	Target
<b>C</b>	Focusing coils
<b>D</b>	Transformers
Correct Ans: <b>A</b>	

<u>Itemcode</u> : <b>RS1037</b>	
<b>Q37:</b> Which of the following nuclei has the largest range for the same initial velocity?	
<b>A</b>	Helium
<b>B</b>	Hydrogen
<b>C</b>	Deuterium
<b>D</b>	Carbon
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1038</b>	
<b>Q38:</b> The physical process of absorption in the interaction of ionizing radiation with tissue is over in	
<b>A</b>	$10^{-5}$ seconds
<b>B</b>	$10^{-10}$ seconds
<b>C</b>	$10^{-3}$ seconds
<b>D</b>	$10^{-15}$ seconds
Correct Ans: <b>D</b>	

<u>Itemcode</u> : <b>RS1039</b>	
<b>Q39:</b> Annual average whole body dose limit for a female radiation worker is:	



<b>A</b>	same as that prescribed for a male radiation worker
<b>B</b>	Lesser than that prescribed for a male worker
<b>C</b>	same as that for a male worker except during pregnancy
<b>D</b>	None of the above
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1040</b>	
<b>Q40:</b> The OER for high LET radiation is equal to:	
<b>A</b>	2.5
<b>B</b>	1
<b>C</b>	1.6
<b>D</b>	4
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1041</b>	
<b>Q41:</b> The peak of latency for leukemia is:	
<b>A</b>	1-2 years
<b>B</b>	5-7 years
<b>C</b>	10-15 year
<b>D</b>	40-50 years
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1042</b>	
<b>Q42:</b> What is direct action?	
<b>A</b>	The atoms of the target itself may be ionized or excited, thus initiating the chain of events that leads to a biologic change
<b>B</b>	The atoms of the target may eject an electron which can produce free radicals which produces biologic damage
<b>C</b>	The photons may directly damage the DNA
<b>D</b>	None of the above
Correct Ans: <b>A</b>	

<u>Itemcode</u> : <b>RS1043</b>	
<b>Q43:</b> As LET increases RBE _____ up to 100 KeV/μm of LET	
<b>A</b>	Increase
<b>B</b>	Decreases
<b>C</b>	Does not change
<b>D</b>	None of the above
Correct Ans: <b>A</b>	

Itemcode : **RS1044**

**Q44:** The  $\alpha/\beta$  ratio for early responding tissues is:

**A** 2.5

**B** 10

**C** 5

**D** 7.5

Correct Ans: **B**

Itemcode : **RS1045**

**Q45:** The dominant factor in determination of late effects is:

**A** Fraction size

**B** Number of fractions

**C** Gap between fractions

**D** Overall treatment time

Correct Ans: **A**

Itemcode : **RS1046**

**Q46:** The mean lethal dose  $D_0$  reduces the cell population by:

**A** 33%

**B** 37%

**C** 63%

**D** 50%

Correct Ans: **C**

Itemcode : **RS1047**

**Q47:** The average  $\alpha/\beta$  ratio for late responding tissues is:

**A** 10

**B** 1

**C** 2.5

**D** 5

Correct Ans: **C**

Itemcode : **RS1048**

**Q48:** The cell survival data are represented by the linear quadratic relationship given by:

**A**  $S = e^{-(\alpha D - \beta D^2)}$

**B**  $S = e^{(\alpha D - \beta D^2)}$

<b>C</b>	$S = e^{-(\alpha D + \beta D^2)}$
<b>D</b>	$S = e^{(\alpha D - \beta D^2)}$

Correct Ans: **C**

Itemcode : **RS1049**  
**Q49:** The special unit of LET is:

<b>A</b>	KeV/ $\mu$ m
<b>B</b>	MeV /cm
<b>C</b>	KeV /mm
<b>D</b>	MeV / $\mu$ m

Correct Ans: **A**

Itemcode : **RS1050**  
**Q50:** The most reactive species which produces damage in indirect action is:

<b>A</b>	H <sub>2</sub> O <sup>+</sup>
<b>B</b>	OH radical
<b>C</b>	H <sub>2</sub> O <sup>-</sup>
<b>D</b>	HO radical

Correct Ans: **B**

Itemcode : **RS1051**  
**Q51:** The use of BED is to determine \_\_\_\_\_

<b>A</b>	Equivalent fractionation schemes
<b>B</b>	Over all treatment time
<b>C</b>	Both Equivalent fractionation schemes and Over all treatment time
<b>D</b>	None of the above

Correct Ans: **S**      **(S Denotes question scrapped and no credit to Candidates.)**

Itemcode : **RS1052**  
**Q52:** The minimum dose required to produce cataract in a single exposure is:

<b>A</b>	12 Gy
<b>B</b>	2 Gy
<b>C</b>	5 Gy
<b>D</b>	10 Gy

Correct Ans: **B**

Itemcode : **RS1053**  
**Q53:** An electron cone has an output of 1.04 cGy/MU at dmax. The MU setting to deliver 200 cGy at 90% isodose level is \_\_\_\_\_ MU.

<b>A</b>	214
<b>B</b>	208
<b>C</b>	200
<b>D</b>	180
Correct Ans: <b>A</b>	

<u>Itemcode</u> : <b>RS1054</b>	
<b>Q54:</b> Dosimetric leaf gap accounts for:	
<b>A</b>	The inherent inaccuracy in the leaf design
<b>B</b>	The different photon energies
<b>C</b>	Round edge leaf to meet the divergence requirements
<b>D</b>	The leaf being double focused
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1055</b>	
<b>Q55:</b> For a megavoltage radiation beam of 10x10 cm <sup>2</sup> its PDD/100 and TMR are plotted as two separate curves against depth (cm) on the same graph. Which of the following is correct?	
<b>A</b>	Both curves will superimpose on each other
<b>B</b>	PDD/100 curve will lie above TMR curve
<b>C</b>	TMR curve will lie above PDD/100 curve
<b>D</b>	The curves superimpose in the shallow depths and then separate out at deeper depths
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1056</b>	
<b>Q56:</b> How many 2-D projection images are required typically to generate a CBCT image?	
<b>A</b>	<50 projections
<b>B</b>	Few hundred projections
<b>C</b>	1000-2000 projections
<b>D</b>	>10,000 projections
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1057</b>	
<b>Q57:</b> In external beam radiotherapy, surface dose is likely to increase with all of the following except:	
<b>A</b>	Use of bolus
<b>B</b>	Use of a beam spoiler
<b>C</b>	Oblique incidence of the treatment beam
<b>D</b>	Lower electron beam energy
Correct Ans: <b>D</b>	

Itemcode : **RS1058**

**Q58:** In patient specific QA, a measurement point has its closest match in the calculated dose distribution that is 3 % and 3 mm off. If you are using gamma criteria of 3 % dose and 3 mm DTA, what is the value of gamma?

- A** 0
- B** 1.1
- C** 1.414
- D** 2.1

Correct Ans: **C**

Itemcode : **RS1059**

**Q59:** Systematic error in patient setup results in:

- A** Blurring of the dose distribution
- B** Compromising dose coverage to CTV
- C** Random side effects on patient
- D** Reducing CTV-to-PTV margin

Correct Ans: **B**

Itemcode : **RS1060**

**Q60:** The advantages of IGRT include all except:

- A** Adaptive treatment planning
- B** Improved spatial accuracy in dose delivery
- C** Decreased CTV-PTV margin
- D** Decreased GTV-to-CTV margin

Correct Ans: **D**

Itemcode : **RS1061**

**Q61:** Which of the following statements about ICRU reference point is not correct?

- A** The point should be located in a region where the dose can be calculated accurately
- B** The point should be in the peripheral region of PTV since it represents the minimum dose received by the PTV
- C** The point should be in the central part of the PTV
- D** For multiple fields, the isocenter is recommended as the ICRU reference point

Correct Ans: **B**

Itemcode : **RS1062**

**Q62:** In gamma analysis, which of the following statement is true?

- A** Both  $\Gamma$  and  $\gamma$  are one and the same
- B**  $\Gamma$  is always smaller than  $\gamma$
- C**  $\Gamma$  can be small than  $\gamma$

<b>D</b>	$\gamma$ is the minimum of $\Gamma$
Correct Ans: <b>D</b>	

Itemcode : <b>RS1063</b>	
<b>Q63:</b> Separating the dose into the primary and secondary or scatter component in radiotherapy:	
<b>A</b>	is not useful
<b>B</b>	helps in the dosimetry of conventional x-ray beams with square fields
<b>C</b>	helps in the dosimetry of irregular fields and in determining the dose under blocked regions of field
<b>D</b>	is not always possible
Correct Ans: <b>C</b>	

Itemcode : <b>RS1064</b>	
<b>Q64:</b> For shielding PET/CT facilities which of following guidelines/recommendations followed by regulators:	
<b>A</b>	AAPM TG- 108
<b>B</b>	AAPM TG- 106
<b>C</b>	AAPM TG- 104
<b>D</b>	AAPM TG- 102
Correct Ans: <b>A</b>	

Itemcode : <b>RS1065</b>	
<b>Q65:</b> The effective point of measurement for central axis depth dose measurement of a Co-60 beam as per TRS 398 protocol is:	
<b>A</b>	geometric enter of the chamber
<b>B</b>	$0.6r_{cyl}$
<b>C</b>	$0.5r_{cyl}$
<b>D</b>	$0.7r_{cyl}$
Correct Ans: <b>B</b>	

Itemcode : <b>RS1066</b>	
<b>Q66:</b> The practical range of an electron beam having a R50 of 2.6 cm is:	
<b>A</b>	4.5
<b>B</b>	3.1
<b>C</b>	2.6
<b>D</b>	1.3
Correct Ans: <b>B</b>	

Itemcode : <b>RS1067</b>	
<b>Q67:</b> Speed of ultrasound depends upon	
<b>A</b>	Wavelength

<b>B</b>	Amplitude
<b>C</b>	Material of medium
<b>D</b>	Interaction cross section
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1068</b>	
<b>Q68:</b> Most of the space in atom is	
<b>A</b>	Filled with positive charge
<b>B</b>	Empty
<b>C</b>	Filled with negative charge
<b>D</b>	Filled with neutrons
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1069</b>	
<b>Q69:</b> The emission of a negatron particle from a nucleus results in	
<b>A</b>	Decrease in atomic number
<b>B</b>	Increase in atomic number
<b>C</b>	increase in atomic mass
<b>D</b>	decrease in atomic mass
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1070</b>	
<b>Q70:</b> Characteristic X-rays also known as:	
<b>A</b>	Thermoluminescent radiation
<b>B</b>	Phosphorescent radiation
<b>C</b>	Fluorescent radiation
<b>D</b>	Isomeric radiation
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1071</b>	
<b>Q71:</b> Which one of the following is the true statement regarding Compton scattering?	
<b>A</b>	Compton mass attenuation coefficient is dependent of Z
<b>B</b>	Compton mass attenuation coefficient is nearly independent of Z
<b>C</b>	Compton mass attenuation coefficient is proportional to $Z^3$
<b>D</b>	Compton mass attenuation coefficient is inversely proportional to $Z^3$
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1072</b>	
<b>Q72:</b> Which of the following known as sparsely ionizing radiation?	

<b>A</b>	Beta radiation
<b>B</b>	Protons and Alpha
<b>C</b>	x -rays
<b>D</b>	Neutron
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1073</b>	
<b>Q73:</b> In which of the following interactions of photon, the photon interacts with atomic electron as if it was a free electron?	
<b>A</b>	Photoelectric effect
<b>B</b>	Compton effect
<b>C</b>	Pair Production
<b>D</b>	Rayleigh scattering
Correct Ans: <b>B</b>	

<u>Itemcode</u> : <b>RS1074</b>	
<b>Q74:</b> Dead time of a G M counter	
<b>A</b>	10-20 $\mu$ sec
<b>B</b>	20-40 msec
<b>C</b>	50-100 msec
<b>D</b>	50-200 $\mu$ sec
Correct Ans: <b>D</b>	

<u>Itemcode</u> : <b>RS1075</b>	
<b>Q75:</b> Fraction of gamma rays escaping through the hole at the end of the well when point source is kept at the bottom of well:	
<b>A</b>	>20%
<b>B</b>	~15%
<b>C</b>	~7%
<b>D</b>	Position does not matter.
Correct Ans: <b>C</b>	

<u>Itemcode</u> : <b>RS1076</b>	
<b>Q76:</b> Which of the following proton interactions in proton therapy has negligible dosimetric manifestation?	
<b>A</b>	Bremsstrahlung
<b>B</b>	Inelastic coulomb scattering
<b>C</b>	Elastic coulomb scattering
<b>D</b>	Non-elastic nuclear reaction
Correct Ans: <b>A</b>	



Itemcode : **RS1077**

**Q77:** Which physical wedge has wedge angle and hinge angle same?

**A** 15°

**B** 30°

**C** 45°

**D** 60°

Correct Ans: **D**

Itemcode : **RS1078**

**Q78:** The volume of well type ion chamber used to calibrate HDR sources is of the order of

**A** 100 cc

**B** 200 cc

**C** 400 cc

**D** 50 cc

Correct Ans: **B**

Itemcode : **RS1079**

**Q79:** Transit dosimetry using EPID is called:

**A** Ex-vivo dosimetry

**B** In-vivo dosimetry

**C** In-transit dosimetry

**D** Absolute dosimetry

Correct Ans: **A**

Itemcode : **RS1080**

**Q80:** The maximum electron energy (in MeV) that can be used if an organ beyond 6 cm depth must be protected from radiation is

**A** 18 MeV

**B** 12 MeV

**C** 6 MeV

**D** 4 MeV

Correct Ans: **B**

Itemcode : **RS1081**

**Q81:** Which of the following is the Physical feature of the Inner or Lesser Himalaya Zone in H.P.?

(i) It lies between the altitudes of 1500 meters and 4000 meters.

(ii) It has a gradual elevation towards the Dhauladhar and Pir Panjal ranges.

(iii) It has the higher ranges in Kinnaur and Spiti.

**A** (i) & (ii).

**B** (ii) & (iii).

**C** (i) only.

**D** (ii) only.

Correct Ans: **D**

Itemcode : **RS1082**

**Q82:** Match the following rivers with their tributary rivers of H.P. correctly :

	<u>River</u>		<u>Tributary</u>
(i)	The Yamuna	(a)	The Banganga.
(ii)	The Satluj	(b)	The Siul.
(iii)	The Beas	(c)	The Giri.
(iv)	The Ravi	(d)	The Spiti.

**A** (i) - (c); (ii) - (d); (iii) - (a); (iv) - (b).

**B** (ii) - (b); (iii) - (a); (iv) - (d); (i) - (c).

**C** (iii) - (d); (iv) - (c); (i) - (b); (ii) - (a).

**D** (iv) - (a); (iii) - (d); (ii) - (c); (i) - (b).

Correct Ans: **A**

Itemcode : **RS1083**

**Q83:** The Economic Survey, 2016-17 of Himachal Pradesh has projected the economic growth of the State at :

**A** 7.5%.

**B** 6.9%.

**C** 6.8%.

**D** 6.5%.

Correct Ans: **C**

Itemcode : **RS1084**

**Q84:** The Centrally sponsored scheme, the Integrated Scheme of Oilseeds, Pulses, Palm Oil, and Maize, launched in 2004-05, has considered which of the following for Himachal Pradesh :

**A** Oilseeds and Pulses.

**B** Maize only.

**C** Pulses only.

**D** Oilseeds only.

Correct Ans: **B**

Itemcode : **RS1085**

**Q85:** Which of the following is correct about the land settlement work in Himachal Pradesh?

- (i) It was started in 1952 from the district of Chamba.
- (ii) It was completed in all the districts in the year 2010.
- (iii) It remained incomplete in a few districts even after 2010.

**A** (i) & (iii).

**B** (ii) & (iii).

**C** (iii) only.

**D** (ii) only.

Correct Ans: **A**

Itemcode : **RS1086**

**Q86:** Find out the correct match of the following districts with the total number of its Block Samitis in H.P. :

	<u>District</u>	<u>Block Samitis</u>
(i)	Shimla	(a) 09.
(ii)	Chamba	(b) 05.
(iii)	Solan	(c) 06.
(iv)	Sirmaur	(d) 07.

**A** (i) – (d); (ii) – (a); (iii) – (b); (iv) – (c).

**B** (i) – (c); (ii) – (d); (iii) – (a); (iv) – (b).

**C** (i) – (b); (ii) – (a); (iii) – (c); (iv) – (d).

**D** (i) – (a); (ii) – (c); (iii) – (d); (iv) – (b).

Correct Ans: **B**

Itemcode : **RS1087**

**Q87:** Which of the following is true about the Scheduled Castes Sub Plan, started for the welfare of Scheduled Castes in Himachal Pradesh?

- (i) It has divided the available resources for them under three heads in order to distribute it judiciously among them.
- (ii) It covers all the districts of Himachal Pradesh.
- (iii) It covers the full districts of Lahaul-Spiti, Kinnaur and the Sub-Divisions of Bharmaur and Pangri of the district of Chamba.
- (iv) It covers the full districts of Lahaul-Spiti, Kinnaur, the Sub-Divisions of Bharmaur and Pangri (in Chamba

district) and Bara Bangahal areas of the district of Kangra.

**A** (i) & (ii).

**B** (ii) & (iii).

**C** (iv) & (ii).

**D** (iii) & (i).

Correct Ans: **D**

Itemcode : **RS1088**

**Q88:** Which of the following pair of three districts of Himachal Pradesh show decline of Female Child Sex ratio in the Census of 2011 from the Census of 2001?

**A** Shimla, Lahaul-Spiti & Kullu.

**B** Mandi, Bilaspur & Kangra.

**C** Shimla, Mandi & Chamba.

**D** Mandi, Hamirpur & Una.

Correct Ans: **C**

Itemcode : **RS1089**

**Q89:** The painting of the 'Kangra Bride' is the creation of artist :

**A** Sobha Singh.

**B** Nocholas Roerich.

**C** Norah Richards.

**D** Amrita Sher-Gil.

Correct Ans: **A**

Itemcode : **RS1090**

**Q90:** Of the following leaders, who did not participate in the Praja Mandal Movement of the Shimla Hill States?

**A** Bhag Mal Sautha.

**B** Shiva Nand Ramoul.

**C** Sat Mahajan.

**D** Bhaskara Nand.

Correct Ans: **C**

Itemcode : **RS1091**

**Q91:** Identify the meeting spot of the Western Ghats with the Eastern Ghats :

**A** The Sunderbans.

**B** The Nilgiri Hills.

**C** The Karakoram Range.

**D** The Arakan Yoma Range.

Correct Ans: **B**

Itemcode : **RS1092**

**Q92:** Of the following, on which first political occasion, the song 'Vande Matram', composed by Bankim Chandra Chatterjee was sung?

- |          |  |
|----------|--|
| <b>A</b> | In the Nagpur Session of the All India Congress, held in 1891.   |
| <b>B</b> | In the Calcutta Session of the All India Congress, held in 1901. |
| <b>C</b> | In the Calcutta Session of the All India Congress, held in 1896. |
| <b>D</b> | In the Bombay Session of the All India Congress, held in 1885.   |

Correct Ans: **C**

Itemcode : **RS1093**

**Q93:** Which of the following is correct about the Ghadr Movement?

- (i) Its headquarters called the Yugantar were in San Francisco (USA).
- (ii) Its first paper was in English.
- (iii) It was started in 1913.
- (iv) Its headquarters were in Vancouver (Canada).

- |          |              |
|----------|--------------|
| <b>A</b> | (ii) & (iv). |
| <b>B</b> | (i) & (iii). |
| <b>C</b> | (i) & (iv).  |
| <b>D</b> | (ii) only.   |

Correct Ans: **B**

Itemcode : **RS1094**

**Q94:** The MUDRA Bank was proposed in the Union Budget of :

- |          |            |
|----------|------------|
| <b>A</b> | 2015 – 16. |
| <b>B</b> | 2014 – 15. |
| <b>C</b> | 2016 – 17. |
| <b>D</b> | 2017 – 18. |

Correct Ans: **A**

Itemcode : **RS1095**

**Q95:** Which of the following is correct about the formation of the Church of the New Dispensation by a social reformer?

- (i) It was formed by Annie Besant.
- (ii) It was formed by Keshav Chandra Sen.

(iii) It was formed by Ram Mohan Roy.

(iv) It was formed to unite all creeds.

**A** (i) & (iv).

**B** (iii) only.

**C** (i) only.

**D** (ii) & (iv).

Correct Ans: **D**

Itemcode : **RS1096**

**Q96:** The Pacific Ocean to the Atlantic Ocean are joined together by which of the following navigation canals?

**A** The Suez Canal.

**B** The New Shipping Canal.

**C** The Panama Canal.

**D** The Keil Canal.

Correct Ans: **C**

Itemcode : **RS1097**

**Q97:** Which of the following is correct about the formation of the USA led-QUAD?

(i) It comprises the USA, India, Japan and Australia.

(ii) It comprises India, the USA, Japan and South Korea.

(iii) China castigates it as an exclusive clique against her.

**A** (i) & (iii).

**B** (ii) & (i).

**C** (iii) & (ii).

**D** (ii) only.

Correct Ans: **A**

Itemcode : **RS1098**

**Q98:** Which of the following is not amendable provision in the Constitution of Thailand?

**A** Equal representation to Federating States.

**B** Monarchy.

**C** Human Rights.

**D** Presidential form of Government.

Correct Ans: **B**

Itemcode : **RS1099**

**Q99:** Which of the following pair of countries won the Gold and Silver medals in Volley ball in the Olympics of 2016, held in Rio de Janeiro (Brazil) :

**A**      Gold      Silver  
Russia and Spain.

**B**      Gold      Silver  
China and Italy.

**C**      Gold      Silver  
Brazil and China.

**D**      Gold      Silver  
Brazil and Italy.

Correct Ans: **D**

Itemcode : **RS1100**

**Q100:** Which of the following is correct about the number of women Noble Prize laureates since the First Noble Prizes were given from 1901?

**A**      50 women.

**B**      58 women.

**C**      74 women.

**D**      65 women.

Correct Ans: **B**