NATIONAL TALENT SEARCH EXAMINATION (NTSE-2017) STAGE -1
UTTAR PRADESH STATE : SAT

Date: 06/11/2016

Max. Marks: 100 **Time allowed: 90 mins**

SOLUTIONS

101. The scientist related to law of electromagnetic induction is

(1) Einstein (2) Rutherford (3) Newton (4) Faraday

Ans. (4)

Sol. Option (4) is correct

The scientist related to law of electromagnetic induction is Faraday.

102. The S.I. unit of temperature is

(1) Degree celcius (2) Degree farenheit (3) Kelvin (4) None of these

Ans. (3)

Sol. S.I. unit of temperature is Kelvin.

103. How many light year (ly) in one metre is

(1) 1.057×10^{-16} ly (2) 9.46×10^{15} ly (3) 2.26×10^{6} ly (4) 4.98×10^{15} ly

Ans. (1)

Sol. $1m = 1.057 \times 10^{-16}$ ly

104. Two different light sources of A and B have wave length 0.7 μm and 0.3 μm respectively. Then which of the following statement is true

(1) A has greater energy than B (2) B has greater energy than A

(3) Both has equal energy (4) None of these

Ans. (2)

Sol. $\lambda_A = 0.7\ \mu m$

$\lambda_B = 0.3\ \mu m$

$E = \frac{hc}{\lambda}$

$E \propto \frac{1}{\lambda}$

More the wavelength lesser will be the energy.

105. Which types of radiation absorbed by CO_2 molecules in atmosphere are

(1) x-rays (2) gamma rays (3) infra-red rays (4) UV rays

Ans. (4)

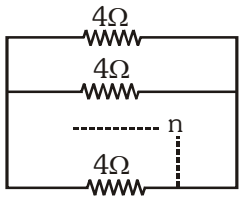
Sol. UV rays are absorbed by CO_2 molecules in atmosphere.

106. If n conducting wire, each of resistance 4Ω is connected in parallel, then its equivalent resistance will be -

(1) 4n (2) 4/n (3) n/4 (4) $4n^2$

Ans. (2)

Sol.



$$\frac{1}{R_{eq}} = \frac{1}{4} + \frac{1}{4} \text{ ..... } \frac{1}{4} \text{ (n times)}$$

$$= \frac{n}{4}$$

$$R_{eq} = \frac{4}{n}$$

107. The speed of sound in air and sea water are 332 m/s and 1140 m/s respectively. A ship sends a strong signal down the sea and detect its echo after 1.5 second. The depth of the sea at that point is

(1) 2.16 km (2) 1.08 km (3) 0.51 km (4) 0.255 km

Ans. ***(2)***

Sol. $V_a = 332$ m/s

$V_w = 1440$ m/s

$t = 1.5$ s

$$V = \frac{2s}{t}$$

$2s = v \times t$

$$S = \frac{1440 \times 1.5}{2}$$

$= 1080$ m

$= 1.08$ km

108. Two body of mass 1gm and 4gm moving with equal kinetic energies. The ratio of the magnitude of their linear momentum is -

(1) 4 : 1 (2) $\sqrt{2}$: 1 (3) (4)

Ans. ***(3)***

Sol. $$\text{K.E.} = \frac{P^2}{2m}$$

$KE_1 = KE_2$

$$\frac{P_1^2}{2m_1} = \frac{P_2^2}{2m_2}$$

$$\frac{p_1^2}{p_2^2} = \frac{m_1}{m_2} = \frac{1}{4} = \frac{1}{2}$$

109. The refractive index of water and glass with respect to air are $\frac{4}{3}$ and $\frac{3}{2}$ respectively. The refractive index of glass with respect to water will be -

(1) $\frac{17}{6}$ (2) $\frac{1}{6}$ (3) 2 (4) $\frac{9}{8}$

Ans. ***(4)***

Sol. R.I. of water $= \frac{4}{3} = n_w$

R.I. of glass $= \frac{3}{2} = n_g$

$$n_g w = \frac{n_g}{n_w} = \frac{3/2}{4/3} = \frac{9}{8}$$

110. A technician has 10 resistor each of resistance 0.1Ω. The lartest and smallest resistance he can obtain by combining these resistors are

(1) 10 Ω and 1 Ω respectively (2) 1 Ω and 1 Ω respectively

(3) 1 Ω and 0.01 Ω respectively (4) 0.1 Ω and 0.01 Ω respectively

Ans. ***(3)***

Sol. 10 resistors 0.1 Ω each.

Largest resistance when connected in series = 1Ω

Smallest resistance when connected in series = 0.01Ω

111. The wire of heater sould made of that material whose

(1) Specific resistance more and melting point high

(2) Specific resistance more and melting point low

(3) Specific resistance low and melting point low

(4) Specific resistance low and melting point high

Ans. ***(1)***

Sol. More the specific resistance more is the resistance hence, more the heat produced.

High melting point is aduisable as wire of heater will not melt.

112. The total internal reflection of light is not possible. When light travels from

(1) Glass to water (2) Water to glass (3) Water to air (4) Glass to air

Ans. ***(2)***

Sol. TIR happens only when a ray of light travels from denser to rarer medium.

113. The frequency of second pendulum is

(1) 0.5 Hertz (2) 1.0 Hertz (3) 2.0 Hertz (4) 1.5 Hertz

Ans. ***(1)***

Sol. Time period of second's pendulum = 2 sec

$$f = \frac{1}{T} = \frac{1}{2} = 0.5 \text{ Hz}$$

114. Two bodies with kinetic energy in the ratio of 9 : 4 are moving with equal linear momentum. The ratio of their masses is

(1) 1 : 2 (2) 1 : 1 (3) 4 : 9 (4) 3 : 2

Ans. ***(3)***

Sol. $K = \frac{P^2}{2m}$

$\Rightarrow P = \sqrt{2mK}$

$\Rightarrow \sqrt{2m_1K_1} = \sqrt{2m_2K_2}$

$\Rightarrow m_1K_1 = m_2K_2$

$\Rightarrow \frac{m_1}{m_2} = \frac{K_2}{K_1} = \frac{4}{9}$

115. The electronic configuration of an ion M^{+2} is 2,8,14. If its mass number is 56 the number of neutrons in its nucleus is -

(1) 30 (2) 32 (3) 34 (4) 42

Ans. (1)

Sol. $M^{+2} = 2,8,14 \rightarrow M = 2, 8, 16$

$\Rightarrow Z = 26 ; A = 56$

A – Z= numbers of neutrons = 56 – 26 = 30

116. In the presence of concentrated sulphuric acid, acetic acid react with ethyl alcohol to produce -

(1) aldehyde (2) alcohol (3) ester (4) carboxylic acid

Ans. (3)

Sol. $CH_3COOH + C_2H_5OH \xrightarrow[H_2SO_4]{Conc.} \underset{Ester}{CH_3COOC_2H_5} + H_2O$

117. Which one of the following metal oxides shows both acidic and basic characters ?

(1) Na_2O (2) K_2O (3) CuO (4) Al_2O_3

Ans. (4)

Sol. $Al_2O_3 + 6HCl \longrightarrow 2AlCl_3 + 3H_2O$

$Al_2O_3 + 2\,NaOH \longrightarrow 2\,NaAlO_2 + H_2O$

118. The molecular formula of potash alum is

(1) $K_2SO_4 . Al_2(SO_4)_3 . 24H_2O$ (2) Ca(OCl)Cl

(3) K_2SO_4 (4) $Al_2(SO_4)_3 . 24H_2O$

Ans. (1)

Sol. Alum is a series of double sulphate salts of monovalent cations and trivalent cations containing 24 molecules of water of crystallisation.

119. The concentration of hydroxide ion in a solution is 1×10^{-10} mole per litre. Its pH value will be:

(1) 4 (2) 8 (3) 10 (4) –10

Ans. (1)

Sol. $pOH = -\log[OH^-]$

$pOH = -\log[1 \times 10^{-10}] = 10$

$pH + pOH = 14.$

$pH + 10 = 14$

$pH = 14 - 10 = 4$

120. Which of the following gas is known as tear gas ?

(1) methyl isocyanide (2) sulphur dioxide (3) chloropicrin (4) nitrous oxide

Ans. (3)

Sol. Chloropicrin gas is commonly used as tear gas. Its chemical formula is CCl_3NO_2.

121. The number of carbon atom in kerosene oil is

(1) $C_6 - C_{11}$ (2) $C_{20} - C_{30}$ (3) $C_{11} - C_{16}$ (4) $C_{18} - C_{22}$

Ans. (3)

Sol. Kerosene is extracted from fractional distillation of petroleum having carbon atoms between C_{11} to C_{20}.

122. Which of the following salt does not contain the water of crystallization ?

(1) blue vitriol (2) baking soda (3) washing soda (4) gypsum

Ans. (2)

Sol. Chemical formula of - blue virtriol $CuSO_4.5H_2O$

Baking Soda - $NaHCO_3$

Washing Soda - $Na_2CO_3 . 10H_2O$

Gypsum - $CaSO_4 . 2H_2O$

123. Acidic solvents are

(1) those who donate proton (2) accept proton

(3) either can give or accept proton (4) neither give nor accept proton

Ans. (1)

Sol. Acidic solvent are those who donate proton

For example $HCl + H_2O \longrightarrow H_3O^+ + Cl^-$.

124. The method to purify the colloidal solution

(1) peptization (2) coagulation (3) dialysis (4) bredig's arc method

Ans. (3)

Sol. Dialysis is the process which is used for the purfication of colloids by filtration or diffusion through, parchment paper or animal membrane.

125. The dispersion of any liquid in a liquid is known as

(1) gel (2) gum (3) gelatin (4) emulsion

Ans. (4)

Sol. Emulsion is a type of colloid in which a liquid is dispersed in liquid eg. milk.

126. Which of the following is made by hydrolysis of starch ?

(1) glucose (2) fructose (3) sucrose (4) maltose

Ans. (1)

Sol. When startch is hydrolysed in the presence of amylase, it forms glucose.

127. Amalgam is

(1) submetal (2) alloy (3) compound (4) hetrogeneous mixture

Ans. (2)

Sol. Alloy

Amalgam is the alloy of any metal with mercury eg sodium amalgam.

Biology

128. The number of salivary galnds in human is:

(1) two pairs (2) three pairs (3) four pairs (4) five pairs

Ans. (2)

Sol. Humans have three pairs of salivary glands i.e. parotid, submaxillary and sublingual gland.

129. Wings of bird and insects are

(1) vestigial organs (2) homologous organs

(3) analogous organs (4) none of these

Ans. (3)

Sol. Wings of birds and insect perform same function but have different origin that is why they are analogous organs.

130. Cramps in the leg muscles after running a long distance are becuase of -

(1) build up of lactic acid (2) build up of acetic acid

(3) build up of oxalic acid (4) build up up of pyruvic acid

Ans. (1)

Sol. Cramps in the leg muscles after runing a long distance are becuase of deposition of lactic acid formed during anaerobic respiration in muscles.

131. Translocation of food by phloem is in the form of -

(1) sucrose (2) protein (3) harmones (4) fat

Ans. (1)

Sol. Translocation of food by phloem is in the form of sucrose because it is highly dissoluble in water.

132. Enzyme responsible for digestion of protein is

(1) ptylin (2) pepsin (3) amylopsin (4) steapsin

Ans. (2)

Sol. Enzyme responsible for digestion of protein is pepsin present in stomach and work in acidic medium.

133. Ethylene harmone is found in the form of -

(1) gas (2) liquid (3) solid (4) all of the above

Ans. (1)

Sol. Ethylene is the gaseous hormone present in plants which is responsible for fruit ripening.

134. Calciferol is -

(1) vitamin A (2) vitamin B (3) vitamin C (4) vitamin D

Ans. (4)

Sol. Calciferol is vitamin D which is important for the development of bones.

135. Sodium benzoyate is

(1) tranquilizer (2) edible colour (3) preservative (4) antibiotic

Ans. (3)

Sol. Sodium benzoyate is a food preservative.

136. The beehive is made of -

(1) cellulose (2) chiten (3) cork (4) wax

Ans. (4)

Sol. Bee hive is made up of wax.

137. In which of the following blubber is found

(1) frog (2) lizard (3) elephant (4) fish

Ans. (4)

Sol. Blubber is a thick fatty layer present in Fishes.

138. In leukemia -

(1) there is lack of oxygen in body (2) white spot made on skin

(3) proliferation of white blood corpuscles takes place (4) red blood corpuscles increases

Ans. (3)

Sol. Leukemia is a blood cancer in which the number WBC increases.

139. Hydrophobia is due to

(1) bacteria (2) virus (3) protozoa (4) fungus

Ans. (2)

Sol. Hydrophobia is due to virus.

140. Silver fish is a

(1) insect (2) cnidarian (3) crustacian (4) fish

Ans. (1)

Sol. Silver fish is a animal of class insects.

141. 'Tripitaka' texts are related with which religion

(1) Vedic religion (2) Biddhism (3) Jainism (4) Slaivism

Ans. ***(2)***

Sol. Tripi?aka, also referred to as Tipi?aka or Pali Canon, is the traditional term for the Buddhist scriptures.

142. The language of sangam litrature was -

(1) Timil (2) Bengali (3) Hindi (4) Marathi

Ans. ***(1)***

Sol. Sangam literature is one of the main sources used for documenting the early history of the ancient Tamil country. The ancient Sangam poems mention numerous kings and princes, the existence of some of whom have been confirmed through archaeological evidence.

143. Ashoka was the son of -

(1) Chandragupta Maurya (2) Brihdrath (3) Bindusar (4) Ramgupta

Ans. (3)

Sol. Ashoka was born to the Mauryan emperor, Bindusara and a relatively lower ranked wife, Dharm? (or Dhamm?). He was the grandson of Chandragupta Maurya.

144. Who was the last emperor of Mughal dynasty in India

(1) Aurangzeb (2) Shahjahan (3) Jahangir (4) Bahadurshah Zafar

Ans. (4)

Sol. Abu Zafar Sirajuddin Muhammad Bahadur Shah Zafar, also known as Bahadur Shah or Bahadur Shah II (October 1775 -- 7 November 1862) was the last of the Mughal emperors in India, as well as the last ruler of the Timurid Dynasty.

145. The grava of Maharani Laxmibai is situated at

(1) Varanasi (2) Kanpur (3) Allahabad (4) Gwalior

Ans. (4)

Sol. Samadhi of Rani Lakshmi Bai, Gwalior

146. Malik Kafur was transfer generat of

(1) Ala-uddin Khilzi (2) Firoz Tughlak (3) Iltutmish (4) Muhammad-bin-Tughlak

Ans. (1)

Sol. Malik Kafur was a eunuch slave who became a general in the army of Alauddin Khilji, ruler of the Delhi sultanate from 1296 to 1316 A.D. He was originally seized by Alauddin's army after the army conquered the city of Khambhat.

147. Ibrahim Lodi was defeated

(1) In the first battle of Panipat (2) In the second battle of Panipat

(3) In the first battle of Talikota (4) In the first battle of Tarain

Ans. (1)

Sol. Sultan Ibrahim was defeated in 1526 at the Battle of Panipat. This marked the end of the Lodi Dynasty and the rise of the Mughal Empire in India led by Babur (r. 1526-1530)

148. Who led the revolt of 1857 in Bihar -

(1) Khan Bahadur Khan (2) Tatiya Tope (3) Kunwar Singh (4) Mangal Pandey

Ans. (3)

Sol. In the small, sleepy town of Jagdishpur, lie the ruins of the palace of Kunwar Singh, a hero of 1857, from Bihar.

149. Who is famous as Deshbandhu -

(1) Chandrashekhar (2) A.O. Hume (3) Chittranjan Das (4) Veer Savarkar

Ans. (3)

Sol. Chittaranjan Das was an Indian politician and Founder-leader of the Swaraj Party in Bengal under British rule.Also known as Deshbandhu.

150. 'Satyarth Prakash' was composed by -

(1) Swami Dayanand Saraswati (2) Mahatma Gandhi

(3) Swami Vivekanand (4) Ram Krishna Paramhans

Ans. (1)

Sol. Satyarth Prakash is a 1875 book written originally in Hindi by Maharishi Dayanand Saraswati, a renowned religious and social reformer and the founder of Arya Samaj.

151. Which among the following is not correctly matched -

(1) Buland darwaja – Akbar (2) Alai Darwaja – Ala-ud-din Khilzi

(3) Tajmahal – Shahjahan (4) Red Ford – Babar

Ans. ***(4)***

Sol. Red Fort was build by Shah Jahan

152. Gulbadan Begum was the daughter of -

(1) Babar (2) Humayun (3) Akbar (4) Shahjahan

Ans. ***(1)***

Sol. Shahzadi Gulbadan Begum was a Mughal Princess, the daughter of Emperor Babur of the Mughal Empire, she is most known as the author of Humayun Nama, the account of the life of her half-brother, Humayun.

153. The Bardavli satyagriha was led by -

(1) Vitthalbhai Patel (2) Sardar Ballabhbhai Patel

(3) Mahadev Desai (4) Mahadev Govind Ranade

Ans. ***(2)***

Sol. Gandhi with Sardar Patel (Bardoli Satyagraha) in 1928. The Bardoli Satyagraha of 1928, in the state of Gujarat, India during the period of the British Raj, was a major episode of civil disobedience and revolt in the Indian Independence Movement.

154. Who was the founder of Brahma Samaj -

(1) Swami Dayanand Saraswati (2) Swami Vivekananda

(3) Raja Rammohan Roy (4) Swami Ram Krishna Paramhans

Ans. ***(3)***

Sol. Brahmo Samaj: First convened in 1828 by Raja Ram Mohan Roy in Calcutta

155. M.S. Swaminathan is associated with -

(1) White revolution (2) Blue revolution (3) Red revolution (4) Green revolution

Ans. ***(4)***

Sol. Mankombu Sambasivan Swaminathan (born 7 August 1925) is an Indian geneticist and international administrator, renowned for his leading role in India's Green Revolution.

156. Panna is famous for -

(1) Petroleum (2) Diamond (3) Coal (4) Gold

Ans. ***(2)***

Sol. Panna is a city and a municipality in Panna district in the Indian state of Madhya Pradesh. It is famous for its diamond mines.

157. India's biggest desert is -

(1) Thar (2) Sahara (3) Atakama (4) Gobi

Ans. ***(1)***

Sol. The Thar Desert, also known as the Great Indian Desert, is a large, arid region in the northwestern part of the Indian subcontinent that forms a natural boundary between India and Pakistan.

158. The best quality of coal is -

(1) Peat (2) Bituminus (3) Anthrecite (4) Lignite

Ans. ***(3)***

Sol. Anthracite has the highest carbon content, the fewest impurities, and the highest calorific content of all types of coal except for graphite.

159. Rihand Valley project is located in -

(1) Uttar Pradesh (2) Bihar (3) Rajasthan (4) Madhya Pradesh

Ans. ***(1)***

Sol. Rihand Dam is a concrete gravity dam located at Pipri in Sonbhadra District in Uttar Pradesh, India.

160. Which of the following is not fibre crop -

(1) Cotton (2) Jute (3) Hemp (4) Rubber

Ans. ***(4)***

Sol. Rubber is a plantation crop used to make natural rubber

161. 5th June is celebrated as -

(1) World Environment day (2) World population day (3) Earth day (4) World health day

Ans. (1)

Sol. World Environment Day (WED) is observed every year on 5 June to raise global awareness to take positive environmental action to protect nature and the planet.

162. Max Muller was a famous _____ scholar -

(1) Russian (2) German (3) Rakan (4) French

Ans. (2)

Sol. Friedrich Max Müller (6 December 1823 - 28 October 1900), generally known as Max Müller, was a German-born philologist and Orientalist

163. Ankleshwar is situated at -

(1) Gujrat (2) Tamilnadu (3) Kerala (4) Punjab

Ans. (1)

Sol. Ankleshwar, (sometimes written Anklesvar) is a city and a municipality in the Bharuch district of the state of Gujarat, India.

164. Whch among the following is not correctly matched ?

(1) Heerakund - Mahanadi (2) Bhakhranangal - Satluj

(3) Nagarjun-Krishna (4) Malateela - Ganga

Ans. (4)

Sol. The Malatila Dam, is a dam in India that was built in 1958 on the ***Betwa River***.

165. The capital of Arunachal Pradesh is-

(1) Agartalla (2) Imphal (3) Gangtok (4) Itangar

Ans. (4)

Sol. Agartala is the capital of Tripura, Imphal is the capital of Manipur, Gangtok is not the capital of any state. Hence Itanagar is the correct answer.

166. Satluj, Beas, Ravi, Chenab and Jhelum are the tributaries of

(1) Indus (2) Tapti (3) Kaveri (4) Krishna

Ans. (1)

Sol. The Indus water system of rivers comprises the main Indus and its major tributaries: the Kabul River and Kurram River on the right bank, and the Jhelum River, Chenab River, Ravi River, Beas River and the Sutlej on the left.

167. Kaziranga National Park is situated in

(1) Uttar Pradesh (2) Assam (3) Gujarat (4) Madhya Pradesh

Ans. (2)

Sol. Kaziranga National Park is situated in Assam.

168. The famous Sanchi Stupa is in

(1) Maharashtra (2) Uttar Pradesh (3) Madhya Pradesh (4) Rajasthan

Ans. (3)

Sol. The Buddhist vihara at Sanchi, famous for its Great Stupa is located at Sanchi Town in Raisen District of the state of Madhya Pradesh, India, it is 46 km north-east of Bhopal.

169. In which state is the Pushkar Fair held -

(1) Punjab (2) Rajasthan (3) Himachal Pradesh (4) Uttar Pradesh

Ans. (2)

Sol. The Pushkar Fair (Pushkar Camel Fair) or locally Pushkar ka Mela is an annual five-day camel and livestock fair held in the town of Pushkar in the state of Rajasthan, India.

170. Who is the present Vice-President of India ?

(1) Smt. Sumitra Mahajan (2) Sri. Rajnath singh (3) Sri. Manoj Sinha (4) Sri. Hamid Ansari

Ans. (4)

Sol. Mohammad Hamid Ansari , (born 1 April 1937) is the 12th and current Vice President of India, in office since 2007.

171. The Chairman of the drafting committee of Indian constituent assembly was

(1) Dr. Bhimrao Ambedkar (2) Sardar Patel (3) Jawaharlal Nehru (4) Dr. Rajendra Prasad

Ans. (1)

Sol. On 29 August 1947, the Constituent Assembly set up a Drafting Committee under the Chairmanship of Dr. B.R. Ambedkar to prepare a draft Constitution for India.

172. The Indian Economy is

(1) Liberal Economy (2) Socialist Economy (3) Mixed Economy (4) Marxisim Economy

Ans. (3)

Sol. Right now the Indian economy is not wholly capitalist, more of capitalism mixed with populist schemes. The bug bear though is the cronyism prevalent, that is not resulting in an equitable growth.

173. The Panchsheel agreement was signed between

(1) India and China (2) India and Bhutan (3) India and Nepal (4) None of the above

Ans. (1)

Sol. The Five Principles of Peaceful Coexistence, known in Nepal and India as the Panchsheel Treaty (from Pali, panch: five, sheel: virtues), are a series of principles which formed the bedrock of the relationship between India and the People's Republic of China.

174. Who is the Chief Commander of Indian Army

(1) Prime Minister (2) Defence Minister (3) President (4) Vice President

Ans. (3)

175. The tenure of Lok Sabha member is

(1) 5 years (2) 6 years (3) 3 years (4) 4 years

Ans. (1)

Sol. Tenure of Lok Sabh is 5 years.

176. International Institution related to child walfare is -

(1) UNICEFF (2) I.L.O. (3) F.A.O. (4) C.N.T.

Ans. (1)

Sol. UNICEF - United Nations International Children Emergency Fund.

177. The main strategy adopted in the new economic policy of 1991 was -

(1) Liberalisation (2) Privatisation (3) Globalisation (4) All of the above

Ans. (4)

Sol. Recommended by Narsimha Rao Committee in 1991.

178. Who is the Author of 'Arthashastra' -

(1) Kalidas (2) Valmiki (3) Vedvyas (4) Kautilya

Ans. (4)

Sol. The Arthashastra is the title of a handbook for running an empire, written by Kautilya (also known as Chanakya, c. 350-275 BCE) an Indian statesman and philosopher, chief advisor and Prime Minister of the Indian Emperor Chandragupta, the first ruler of the Mauryan Empire.

179. Who among the following received Nobel Prize in the field of economics -

(1) Mother Teresa (2) Rabindranath Tagore (3) Amartya Sen (4) C.V. Raman

Ans. (3)

Sol. Amartya Kumar Sen is an Indian economist and philosopher of Bengali ethnicity, who since ... He was awarded the Nobel Memorial Prize in Economic Sciences in 1998 and Bharat Ratna in 1999 for his work in welfare economics.

180. Who was the Chairman of the Committee, which proposed Democratic Decentralisation and Panchayati Raj -

(1) K.M. Pannikar (2) Balwant Rai Mehta (3) Mahatma Gandhi (4) H.N.Kunjru

Ans. ***(2)***

Sol. Panchayati Raj System in India had passed through various stages. The first stage in this direction was Balwant Rai Mehta Committee.

181. $\cos\theta \sqrt{\sec^2\theta - 1}$ is equal to -

(1) $\sin\theta$ (2) $\cot\theta$ (3) $\sec\theta$ (4) 1

Ans. (1)

Sol. $\cos\theta \sqrt{\sec^2\theta - 1}$

$\cos\theta \sqrt{\tan^2\theta}$ $[\sec^2\theta - 1 = \tan^2\theta]$

$\cos\theta \cdot \tan\theta$

$\cos\theta \cdot \dfrac{\sin\theta}{\cos\theta}$

$\sin\theta$

182. For the maximum value of sin x, value of x is -

(1) $\dfrac{\pi}{4}$ (2) $\dfrac{\pi}{2}$ (3) π (4) $\dfrac{3\pi}{2}$

Ans. (2)

Sol. $x = \dfrac{\pi}{2}$

183. If $2x + 3y + z = 0$ then $8x^3 + 27y^3 + z^3 \div xyz$ is equal to -

(1) 0 (2) 6 (3) 18 (4) 9

Ans. (3)

Sol. $2x + 3y + z = 0$

$8x^2 + 27y^3 + z^3 = 3 \cdot 2x \cdot 3y \cdot z$ [If $a + b + c = 0$]

$= 18\,xyz$ $a^3 + b^3 + c^3 = 3abc$

$$\frac{8x^3 + 27y^3 + z^3}{xyz} = \frac{18xyz}{xyz} = 18$$

184. The sum of the roots of quadratic equation $2x + \dfrac{4}{x} = 9$ is -

(1) 7/2 (2) $\dfrac{9}{2}$ (3) 3 (4) $\dfrac{-9}{2}$

Ans. (2)

Sol. $2x + \dfrac{4}{x} = 9$

$2x^2 + 4 = 9x$

$2x^2 - 9x + 4 = 0$

$2x^2 - 8x - x + 4 = 0$

$2x(x - 4) - 1(x - 4) = 0$

$(2x - 1)(x - 4) = 0$

$$\alpha + \beta = -\frac{b}{a} = -\left(-\frac{9}{2}\right) = \frac{9}{2}$$

185. If the volume of two spheres are in the ratio is 64 : 27 then the ratio of their surface area is -

(1) 3 : 4 (2) 4 : 3 (3) 9 : 16 (4) 16 : 9

Ans. (4)

Sol. $$\frac{\frac{4}{3}\pi r_1^3}{\frac{4}{3}\pi r_2^3} = \frac{64}{27}$$

$$\frac{r_1}{r_2} = \frac{4}{3}$$

$$\frac{4\pi\left(\frac{r_1}{r_2}\right)^2}{4\pi} = \frac{16}{9}$$

186. If the H.C.F. of the expression $(a^2 - 1)$ and $p\,a^2 - q\,(a + 1)$ is $(a - 1)$ then relation between p and q will be -

(1) p = q (2) p = 2q (3) p = 2q + 1 (4) p = q + 1

Ans. (2)

Sol. $a - 1 = 0$

$a = 1$

$p(1)^2 - q(1 + 1) = 0$

$p - 2q = 0$

$p = 2q$

187. The measures of the five angles of a hexagon are equal and the sixth angle measures 100°, then the measure of each of the five angle is -

(1) 120° (2) 124° (3) 128° (4) 130°

Ans. (2)

Sol. Let each equal angle be x

$5x + 100^\circ = 720^\circ$

$x = 124^\circ$

188. The value of $\dfrac{(0,7)^0 - (0,1)^{-1}}{\left(\frac{3}{8}\right)^{-1}\left(\frac{3}{2}\right)^3 + \left(-\frac{1}{3}\right)^{-1}}$ is –

(1) $-\frac{3}{2}$ (2) $\frac{2}{3}$ (3) 3 (4) 2

Ans. (1)

Sol. $\dfrac{(0.7)^{\circ}-(0.1)^{-1}}{\left[\frac{3}{8}\right]^{-1}\left[\frac{3}{2}\right]^{3}+\left(-\frac{1}{3}\right)^{-1}}$

$$\frac{1-10}{\frac{8}{3}\times\frac{27}{8}-3}=\frac{-9}{9-3}=\frac{-9}{6}$$

$$=-\frac{3}{2}$$

189. If the angles of elevation of the top of a tower from two point at distances 'a' and 'b' from the foot of the tower and are in the same line, are complementary, the height of the tower is -

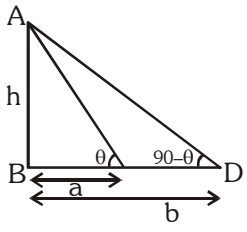
(1) ab (2) $\sqrt{b}$ (3) $\sqrt{a}$ (4) $\sqrt{ab}$

Ans. (4)

Sol. Let AB be the tower of height h and C and D are two points at distance a and b.

In Δ ABC

$\tan\theta = \dfrac{h}{a}$ ...(1)



$\tan(90-\theta) = \dfrac{h}{b}$

$\text{Cot}\,\theta = \dfrac{h}{b}$ ...(2)

Multiplying (1) & (2)

$1 = \dfrac{h^2}{ab}$

$h^2 = ab$

$h = \sqrt{ab}$

190. If $p = x + \dfrac{1}{x}$ then the value of $p - \dfrac{1}{p}$ will be -

(1) 3x (2) $\dfrac{3}{x}$ (3) $\dfrac{x^4+x^2+1}{x^3+x}$ (4) $\dfrac{x^4+3x^2+1}{x^3+x}$

Ans. (3)

Sol. $p = x + \dfrac{1}{x} = \dfrac{x^2+1}{x}$

$$\frac{1}{p}=\frac{x}{x^2+1}$$

$$p-\frac{1}{p}=\frac{x^2+1}{x}-\frac{x}{x^2+1}$$

$$=\frac{(x^2+1)^2-x^2}{x(x^2+1)}$$

$$= \frac{x^4 + 1 + 2x^2 - x^2}{x(x^2+1)} = \frac{x^4 + x^2 + 1}{x^3 + x}$$

Option (3)

191. If $\log_5 [\log_2(\log_3 x)] = 0$ then the value of x is

(1) 3 (2) 6 (3) 9 (4) 0

Ans. (3)

Sol. $\log_5 [\log_2(\log_3 x)] = 0$

$1 = \log_2(\log_3 x)$

$2^1 = \log_3 x$

$3^2 = x$

$x = 9$

192. Angle between the lines $6 + x = 0$ and $3 - y = 0$ will be

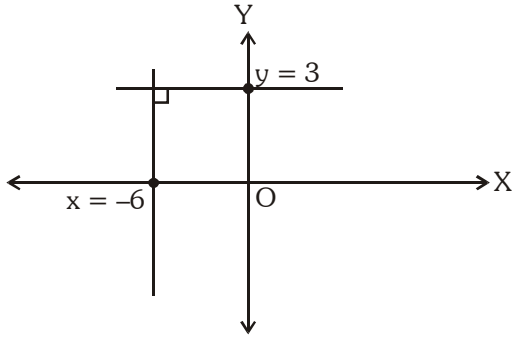
(1) 0° (2) 90° (3) 180° (4) 60°

Ans. (2)

Sol. $x = -6$

$y = 3$

angles between them is 90°



193. If number 6,8,2x – 5, 2x – 1, 15,17,20 and 22 are in asending order and its mediun is 14 then the value of x will be

(1) 14 (2) 7 (3) 15 (4) 20

Ans. (2)

Sol. 6,8,2x –5, 2x – 1, 15,17,20,22

$$\frac{2x - 1 + 15}{2} = 14$$

$2x + 14 = 28$

$2x = 14$

$x = 7$

194. If U = {1,2,3,4,5,6,7,8}

A = {3, 4,5,6} and B = {1,3,5,7}

then the value of (A' – B') is -

(1) {2, 8} (2) {3, 5} (3) {1, 7} (4) {1,2,4,6}

Ans. (3)

Sol. A' = {3, 2,7,8}

B' = {2,4,6,8}

A' – B' = {1, 7}

195. Factor of $\frac{1}{3}c^2 - 2c - 9$ are

(1) $\left(\frac{1}{3}c+3\right)(c+3)$ (2) $\left(\frac{1}{3}c-3\right)(c-3)$ (3) $\left(\frac{1}{3}c-3\right)(c+3)$ (4) $\left(c-\frac{1}{3}\right)(3c+1)$

Ans. (3)

Sol. $\frac{1}{3}\ c^2 - 2c - 9$

$\frac{1}{3}\ (c^2 - 6c - 27)$

$\frac{1}{3}\ (c^2 - 9c + 3c - 27)$

$\frac{1}{3}\ [c(c-9) + 3(c-9)]$

$\frac{1}{3}\ (c+3)(c-9)$

$\left(\frac{1}{3}c-3\right)(c+3)$

196. If Rs. 810 divided among A, B and C are in ratio $\frac{1}{4}:\frac{2}{5}:1\frac{3}{8}$ then the share of A will be

(1) Rs. 100 (2) Rs. 160 (3) Rs. 550 (4) Rs. 200

Ans. (1)

Sol. $\frac{1}{4}:\frac{2}{5}:\frac{11}{8}$

A's share $= \frac{\frac{1}{4}}{\frac{1}{4}+\frac{2}{5}+\frac{11}{8}} \times 810$

$\frac{\frac{1}{4}\times 810}{\frac{10+16+55}{40}} = 100$

197. The radius of a wheel is 0.25m. The number of revolution to travel a distance of 11 km will be

(1) 1000 (2) 4000 (3) 8000 (4) 7000

Ans. (4)

Sol. r = 0.25 m

$2 \times \frac{22}{7} \times 0.25 \times n = 11000$

$n = \frac{11000\times 7}{2\times 22\times 0.25} = 7000$

198. Sum of odd numbers between 0 and 50 is

(1) 625 (2) 600 (3) 900 (4) 1200

Ans. (1)

Sol. $S_n = 1 + 3 + 5 + \ldots\ldots\ldots + 49$

$a = 1$, $d = 2$

$a_n = 49$

$1 + (n - 1)2 = 49$

$n - 1 = \frac{48}{2} = 24$

$n = 25$

$S_n = \frac{25}{2}(1 + 49)$

$= 25 \times 25 = 625$

199. A father is 7 times as old as his son. Two years ago, the father was 13 times as old as his son. Father's present age is

(1) 24 years (2) 28 years (3) 30 years (4) 32 years

Ans. (2)

Sol. Let Son's age = x

Father's age = 7x

Two years ago

Son's age = x – 2

Father age = 7x – 2

Acc. to question

$7x - 2 = 13(x - 2)$

$7x - 2 = 13x - 26$

$24 = 6x$

$x = 4$

Fahter's age = $7 \times 4 = 28$ years

200. The areas of three adjacent faces of a cuboid are a,b and c respectively. Twice of its volume is

(1) $2abc\ m^3$ (2) $2\sqrt{a^2 + b^2 + c^2}\ m^3$ (3) $2\sqrt{abc}\ m^3$ (4) $6\sqrt{abc}\ m^3$

Ans. (3)

Sol. Let length = x

breadth = y

height = z

$a = xy$

$b = yz$

$c = zx$

$abc = x^2y^2z^2$

$\sqrt{abc} = xyz$

$V = \sqrt{abc}$

$2V = 2\sqrt{abc}$